

THE MOBILE MODULAR SURGICAL HOSPITAL: THE ARMY MEDICAL
DEPARTMENT'S FUTURE UNIT OF ACTION

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Strategy

by

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ABSTRACT

THE MOBILE MODULAR SURGICAL HOSPITAL: THE ARMY MEDICAL DEPARTMENT'S FUTURE MEDICAL UNIT OF ACTION, by MAJ Shawn C. Nessen, 101 pages.

The United States Army is rapidly becoming a modular, highly mobile force based on specific capabilities. The Army Medical Department (AMEDD) has tried to adapt the combat support hospital to support the “unit of action” concept. Based on Operation Iraqi Freedom, the combat support hospital does not appear to provide the mobility or modularity required to support the evolving force structure designed around modular concepts and the brigade combat teams.

Early during Operation Iraqi Freedom, the combat support hospitals fell behind the forces they were tasked to support and none were established near Baghdad until after its fall. By contrast, the 212th MASH was able to support the war because of its 100 percent mobility.

The AMEDD needs to develop a modular hospital possessing the capability to support UEx (Division/Corps) combat operations with a base capability of an appropriate size to support stability operations. Modularity can be achieved by re-organizing the professional filler system into medical detachments for all medical and nursing capabilities. Medical detachments would centralize AMEDD control of deployments, and allow the medical unit of action commanders the flexibility they require to plan for varied missions without the burden of split-based operations.

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ACRONYMS

AMEDD	Army Medical Department
AO	Area of Operations
BCT	Brigade Combat Team
CASEVAC	Casualty Evacuation
CSS	Combat Service Support
CSH	Combat Support Hospital
CSA	Corp Support Area
DEPMEDS	Deployable Medical System
EAC	Echelons above Corps
FST	Forward Surgical Team
ICU	Intensive Care Unit
LOC	Lines of Communication
MASH	Mobile Army Surgical Hospital
MEDEVAC	Medical Evacuation
MF2K	Medical Force 2000
MRI	Medical Reengineering Initiative
MILVAN	Military Van (large metal container)
MOOTW	Military Operations Other Than War
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
PROFIS	Professional Filler System
TDA	Table of Distribution and Allowances

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CHAPTER 1

INTRODUCTION

The United States Army Medical Department (AMEDD) is tasked with providing combat health service on the battlefield. The United States Army is rapidly becoming a modular, highly mobile force capable of arriving on the battlefield prepared to fight. Recognizing the need for a more mobile and deployable combat hospital after Operation Desert Storm and Shield, the AMEDD began the combat support hospital (CSH) medical reengineering initiative (MRI) effort. Subsequently, the AMEDD has tried to adapt the combat support hospital to support the “unit of action” concept. Based on the performance of the combat support hospitals in phase III operations of Operation Iraqi Freedom, the combat support hospital does not appear to provide the mobility or modularity required to support the evolving force structure designed around modular concepts and the agile brigade combat teams. In fact, the current force structure was not adequately supported.

The level III hospital is a product of the medical echelon system that has evolved from the AMEDD’s experience of supporting ground forces in large conflicts with many casualties in relatively fixed theaters.¹ Historically, the AMEDD has attempted to provide a mobile level III hospital to support maneuvering forces. Level III has typically been the first place where an injured soldier received comprehensive surgical care. In World War II, portable army surgical hospitals were developed to provide maneuverability. By the Korean Conflict, the portable army surgical hospitals had evolved into the mobile army surgical hospitals (MASH) that was able to provide care for a dynamic battlefield.²

Striking a balance between capabilities and mobility proved difficult, and the mobility of hospital units decreased as capabilities increased. By the time of the Vietnam War, smaller mobile hospitals were replaced by the larger fixed hospitals that brought tremendous capability and hospital beds to the battlefield, but sacrificed mobility.³

These large and complex hospitals have remained the Army standard. The combat support hospital relies on corps level transportation assets for movement to arrive where it is needed on the battlefield. In linear operations, the CSH is located in the corps support area (CSA).⁴ However, in recent operations U.S. Forces have largely lacked nearby corps support areas, and sufficient transportation assets to move the hospitals have not been available in a timely manner.

In Operation Iraqi Freedom I (OIF I), no corps assets were made available to move any of the deployed combat support hospitals. In order to move the hospitals, CSH commanders on the ground were required to pool their meager organic transportation assets, consolidate their units into small sections, and move them close enough to the fighting to be effective. Because of this, the level III combat support hospitals quickly fell behind the forces they were tasked to support and no CSH was established near Baghdad until after its fall.⁵ By contrast, a legacy level III unit, the 212th MASH was able to provide support near the war because of its 100 percent mobility.⁶

The capabilities of the combat support hospitals were further degraded when they were split into two sections once in theater. Shortages of personnel and equipment that followed resulted in degraded health care (especially surgical capability) degraded command and control, and reduced facilities and support such as laundry, maintenance,

and dining facilities.⁷ Clearly, the combat commanders on the ground required a new type of level III hospital.

The US Army has become smaller, faster, and more efficient with the capability of conducting operations across large and dispersed battlefields. The purpose of this paper is to determine if the AMEDD needs to be able to field a smaller, mobile, modular surgical hospital which can be rapidly deployed and quickly established forward on the battlefield, or if the current medical reengineering initiative combat support hospital possesses the required capability.

Research Question

Based on the recent performance of the Army Medical Departments combat health support on the battlefield, the primary research question is how should the AMEDD provide Level III, and IV combat health support to the unit of action (brigade combat team), UEx (future division/corps), and UEy (future corps/army)? Secondary research questions that will be addressed include:

1. What is an effective functional core module for a level III facility?
2. How can the hospital be expanded?
3. What is the mobility requirement?
4. What is the role for a level IV facility?

Using modular concepts and specialty medical teams, the level III hospital should be expandable to meet any contingency, including the ability to provide a level IV capability when needed for major combat operations and stability operations.

Assumptions

Some basic assumptions will be made while researching this thesis. It is likely that level III care will continue to be required in a variety of different combat environments across the full spectrum of operations. It is likely that modular concepts will restrict the availability of non-organic transportation assets. It is also assumed that the types of injuries encountered in recent operations will be the same types of injuries seen in the future, and that the numbers injured will be relatively constant. It is also likely that the AMEDD will be required to provide care to enemy prisoners of war and injured civilians within the theater of operations. Also, the AMEDD will presumably continue to be constrained by professional personnel shortages and the professional filler system will continue to be necessary.

Operational Terms and Definitions

Levels of Medical Care: The levels of medical care are also known as the echelons of medical care and include five levels. Level I is the most basic and the complexity of care increases to level V which is provided at fixed facilities generally located in the Continental United States (CONUS).

Level (Echelon) I: This level of care is provided forward on the battlefield or at the location of injury in non-linear operations. It includes self-aid, buddy aid, or care provided by a combat lifesaver trained member of the unit. Level I also includes care provided by the 91W combat medics. The combat medic is specifically trained to provide trauma care and evacuation. The level I medical treatment facility (battalion aid station) provides triage, treatment, and evacuation. The personnel assigned include a physician, physician's assistant, and medics.⁸

Level (Echelon) II: Forward support medical companies and main support medical companies provide this level of care. This echelon includes basic medical care, optometry, combat stress control and psychiatric care, laboratory, x-ray, and dental care. Level II medical treatment facilities have limited holding capacity (usually 40 beds per company) and are 100 percent mobile. Medical companies may provide surgical capability if they are augmented by a forward surgical team (FST).⁹

Level (Echelon) III: This level of care is provided by the corps combat support hospital. According to FM 4-02.10, *Theater Hospitalization*:

Minimum operational functions required for a level III hospital include: command, control, and communications; patient administration; nutritional care; supply and services; triage; emergency medical treatment; preoperative care; orthopedics; general surgery; operating rooms and central material and supply services; anesthesia, nursing services (to include intensive and intermediate care wards); pharmacy; clinical laboratory and blood banking; radiology services; and hospital ministry services. . . . Level III hospitalization provides hospital care to all classes of patients and with medical re-supply can indefinitely sustain care. The Level III hospital in some environments may be augmented with specialty teams, such as head and neck or renal hemodialysis teams.¹⁰

Level (Echelon) IV: This level of care has traditionally been provided by large general hospitals and field hospitals with approximately 500 beds and specialized and rehabilitative care. The field and general hospitals are being replaced with the 248-bed echelon above corps hospital (EAC CSH). This hospital when augmented provides specialized surgical and medical care. Cardiology is an example of specialized medical care, and neurosurgery is an example of specialized surgical care possibly found at the EAC CSH. Sometimes, fixed hospitals, such as Landstuhl Regional Medical Center, outside the continental United States serve as Level IV hospitals.¹¹

Level (Echelon) V: This level of care is provided by military, Veterans Affairs, and civilian hospitals located in the United States.¹²

The Medical Force 2000 Combat Support Hospital (MF2K) CSH: A 296-bed hospital with 96 intensive care unit beds (ICU), 140 intermediate care unit beds, 20 neuropsychiatric beds, and 40 minimal care beds. The hospital has up to eight operating tables and provides resuscitation, and resuscitative surgery, and stabilization. The types of surgery provided include general abdominal, thoracic, vascular, urological and neurological surgery as well oral maxillofacial and orthopedic surgery. The hospital staff is also capable of managing patients with non-surgical illness, and may stabilize patients for further evacuation or return patients to duty, and is not staffed or equipped to provide long term or rehabilitative care.

The hospital is staffed with 175 officers and 429 enlisted, and is typically commanded by a colonel and has a typical operational staff that includes a personnel, intelligence, operations, and logistics officer. It also has a typical medical staff structure including a Deputy Commander for Clinical Services and a Deputy Commander for Nursing Services. The hospital is equipped with a pharmacy, X-ray section, clinical laboratory, blood bank, dining facility, laundry facility, and maintenance section. It is considered 35 percent mobile, is primarily transported in MILVANs, and is comprised of two modules. The Hospital Unit Base (HUB) and the Hospital Unit Surgical (HUS). The HUB is the main portion of the hospital and is 236 beds. The HUS is 60 beds and 4 operating beds and is capable of providing surgical care independent of the HUB for short periods. This makes the hospital capable of echeloned movement. However, it is not capable of independently moving patients. When fully deployed, the MF2K CSH requires 30.3 acres. The majority of level III hospitals deployed in Operation Iraqi Freedom were MF2K combat support hospitals.¹³

Corps Combat Support Hospital (Corps CSH): The corps combat support hospital is also known as the 248-bed corps combat support hospital and the medical reengineering initiative combat support hospital (MRI CSH). This hospital provides hospitalization and outpatient services to all types of patients. The hospital is comprised of a headquarters section and two hospital companies, one of 84 beds and one of 164 beds. The headquarters detachment has 15 officers and 44 enlisted personnel. The 84-bed company has 24 hospital ICU beds and two operating tables. It also has 60 intermediate care beds including beds for neuropsychiatric patients. 56 officers and 112 enlisted personnel staff the 84-bed company. The second hospital company is a 164-bed company, which has 24 ICU beds, 4 operating room tables, and 140 intermediate care beds including neuropsychiatric beds. The 164-bed company is staffed by 84 officers and 169 enlisted personnel. The 248-bed CSH provides hospitalization for all classes of patients. Surgical capabilities include general, orthopedic, thoracic, urological, gynecological, and oral maxillofacial. It also provides routine and emergency dental treatment. Other specific capabilities include pharmacy, psychiatry, laboratory, blood bank, X-ray, physical therapy and nutrition care services. The Corps CSH is designed to be capable of performing split-based operations. It can also deploy an early entry hospitalization element (44-Bed) unit that provides an element capable of caring for “all classes of patients” which is 100 percent mobile with organic assets.¹⁴

Echelon Above Corps Combat Support Hospital (EAC CSH): The EAC CSH has the same capability as the Corps CSH except it is not capable of split based operations and has no organic transportation capability.¹⁵

Mobile Army Surgical Hospital (MASH): The 212th MASH was the only remaining MASH in the US Army during OIF I. It is a small level III hospital that was 100 percent mobile and capable of providing resuscitative and definitive (stabilization) surgery. The 212th MASH has 36 beds capable of providing intensive and ward care. The MASH is staffed by approximately 160 soldiers including doctors, nurses, medical service corps, and enlisted personnel.¹⁶

Forward Surgical Team (FST): The FST is a surgical unit capable of providing emergency resuscitative surgery and orthopedic stabilization with 2 operating beds. The FST has 20 personnel including 3 general surgeons (general abdominal, vascular, and thoracic), 1 orthopedic surgeon, and 2 nurse anesthetists. It also has critical care nursing capability. The FST has no organic logistical support. It has no X-ray, and limited laboratory and pharmacy capability. It is 100 percent mobile, and usually co-locates with a forward support medical company.¹⁷

Evacuation Hospital: The evacuation hospital is a legacy level III hospital that is being replaced by 248-bed corps CSH and EAC CSH.

General Hospital: A level IV 476-bed semi-permanent hospital that provides specialty surgical and medical care. The EAC CSH is replacing this hospital.

Field Hospital: A level IV 504-bed semi-permanent hospital that primarily provides convalescent care. The EAC CSH is replacing this hospital.

Medical Evacuation (MEDEVAC): This term refers to the evacuation of injured personal by medically trained personnel in ground or air ambulances.

Casualty Evacuation (CASEVAC): This term refers to the evacuation of personnel in non-medical transportation assets without medically trained personnel attending the injured.

Resuscitative Surgery: This term generally refers to surgery that is immediately required to save a life, frequently by controlling severe bleeding. This type of surgery may also refer to procedures that control the airway to allow breathing, relieve pressure on the brain or in the chest cavity, and control spillage of fecal material from bowel injury. Personnel located in Level II forward surgical teams and level III combat support hospitals are capable of performing this type of surgery.

Definitive Surgery: This type of surgery is generally corrective of a specific injury. Some definitive surgery must be done in the combat zone. An example is the vascular repair of an injured artery. In the case of an arterial injury, definitive surgery will be performed at a level II or III facility. Orthopedic injuries however, are generally stabilized at a level II or III facility and transferred to CONUS where definitive surgery, sometimes using internal fixation devices, is performed.

Professional Filler System (PROFIS): Operational medical units like combat support hospitals when not deployed do not have medical professionals like physicians and nurses present at the unit. These PROFIS personnel are assigned both to permanent TDA facilities and the PROFIS (operational unit). In the event of activation, the PROFIS personnel move from the TDA to the operational unit and deploy with them. PROFIS personnel are required to train at least five days annually for their PROFIS duties.¹⁸

Deployable: This term refers to the ease with which a tactical organization can be moved from its normal base of operations to another theater. Deployability is frequently

inversely related to a unit's capabilities. For example, heavy units containing armor are much heavier than light infantry units and therefore armored units are less easily deployed than light infantry units.

Mobility: Mobility is a measure of a unit's ability to move itself using its own (organic) transportation assets. A unit is 100 percent mobile when it can move all of its equipment and personnel at the same time. Mobility increases tactical flexibility by optimizing the ability to redistribute and relocate resources rapidly.

Semi mobile: A unit that is capable of moving only a portion of its assets at a given time.

Modular: Refers to self-contained units that can be attached and detached to and from larger elements with minimal augmentation or reorganization.

Operation Iraqi Freedom (OIF) I: Operation Iraqi Freedom refers to the operation to liberate Iraq from the Saddam Hussein regime. OIF I refers to the first year of the operation. OIF II refers to the second year of the operation and so on.

Phase III: This term refers specifically to offensive operations that were conducted to liberate Iraq. It is sometimes referred to as the maneuver phase of Operation Iraqi Freedom I.

Unit of Action (Brigade Combat Team): A brigade with its normal combat forces which has additionally been augmented with support elements previously controlled by divisions and corps.¹⁹

Unit of Employment X (UEX): The Unit of Employment X is a headquarter element which is able to command and control the modular brigade combat teams (BCT)

or units of action. This headquarter element is able to task organize by selectively employing different types of BCTs and support brigades.²⁰

Unit of Employment Y (UEy): This unit is similar to the UEx except it operates at the Corps or Army level. It is a headquarter element capable of controlling large organizations including combined force land components command, joint air force component command, and joint special forces task forces, among others.²¹

Major Combat Operations: This term refers to combat forces actively engaged in offensive or defensive operations.

Smaller Scale Contingencies: Refers to operations in which military units are deployed to support missions in which the main purpose of the deployed force is not major combat operations.

Military Operations Other Than War (MOOTW): These operations involve the deployment of military forces for non-combat purposes often involving humanitarian relief or providing security for peace operations.

Linear Operations: “Typically, linear operations involve conventional combat and concentrated maneuver forces. Ground forces share boundaries and orient against a similarly organized enemy force. Terrain or friendly forces secure flanks and protect CSS operations.”²²

Nonlinear Operations: “Maneuver units operate in noncontiguous areas throughout the AO . . . maneuver forces may orient on objectives without geographic reference to adjacent forces. Nonlinear operations proceed along multiple lines of operation-geographic, logical, or both. Lines of communication often diverge from lines

of operations, and sustaining operations may depend on CSS moving with maneuver units or delivered by air.”²³

Limitations

The data that will be collected for analysis for this thesis will in large part be obtained from unit after action reviews and personal interviews. The time available for collecting this data is limited to a relatively short period of time in the academic year. Several operations will be examined primarily by studying organizational and individual after action reviews. The time required to evaluate these reports will limit the time available for interviews. Because of this, personal interviews will be limited in number, and will only be conducted with personal that served in level III hospitals in Operation Iraqi Freedom.

The quality of data available for analysis is variable. Some hospitals serving in Operation Iraqi Freedom wrote detailed after action reviews while others were more limited and individual in scope. Personal interviews will serve to fill gaps in written reports, but could be biased based on individual experience.

The author’s experience in research has been in scientific studies using quantitative methods, with limited experience using qualitative methods. The author also served in two combat support hospitals in Operation Iraqi Freedom I. While this experience inspired the author to evaluate the role of the combat support hospital, bias will need to be carefully avoided.

Scope and Delimitations

The purpose of this thesis is to evaluate how the AMEDD will deliver level III combat health support in the future. One of the key aspects of this research will be to

evaluate the level III hospital's ability to provide care during rapid maneuver typically seen in offensive operations and historically seen in retrograde actions. Although most modern armies are accompanied by health support, this thesis will be limited to a study of the United States Army Medical Department and its historical and recent combat health support.

The United States Air Force and Navy both possess level III hospitals that provide care similar to the United States Army level III hospitals. These hospitals are more easily deployed than similar Army hospitals, and are quite easily established at airfields and near ports, but they are not equipped with transportation assets making them incapable of independent movement on land.²⁴ The United States Navy has historically been responsible for providing level III care to The United States Marine Corps; however, in joint combined force land component operations, level III combat health support will likely be provided by the AMEDD during the maneuver phase of offensive operations. Because the hospital mobility requirement is unique to ground forces, this study will not include a discussion of the health support capabilities of the United States Air Force or the United States Navy.

Although the constraints on personnel are accepted as unlikely to change, the author assumes that adequate funding will be available to purchase the equipment required for possible unit models that may be proposed as a result of this research.

Finally, this research will be limited to unclassified sources. Access to classified information will not be sought for the purpose of this research, and would be unlikely to add to the final product.

Significance of this Study

Combat health support is important as a combat multiplier and has strategic, operational, and tactical implications. At the strategic level, the AMEDD has fixed resources and the Surgeon General must provide medical care at all of the five levels of care. The same pool of professionals provides care for all treatment levels. A surgeon working at the strategic level at Walter Reed Army Medical Center one day may find himself working at the tactical level on a forward surgical team the next. It is important the AMEDD therefore have efficient structures at all treatment levels in order to provide the best care possible across the spectrum of medical operations, and to allocate its resources properly.

The 2005 National Military Strategy directs that military forces be capabilities based, and key operational capabilities that apply to the Army Medical Department include projecting and sustaining forces in environments that are difficult to access and improving proficiency against irregular challenges potentially over long periods. Key attributes of military units include those that will allow them to defend the homeland, operate in four forward regions, swiftly defeat enemies in overlapping military campaigns and conduct a limited number of contingency operations ranging such as Operation Provide Hope or Provide Comfort.²⁵ Supporting all of these possibilities requires a flexible and efficient hospital unit. This research is intended to evaluate the efficiency of the level III combat support hospital, and to determine if it is currently designed to provide a mobile and modular capability which can be easily adapted to various mission requirements without tying up resources needed elsewhere.

The results of this research could lead to unit models which are more deployable and mobile, and which give commanders the flexibility to plan for specific missions using modular concepts. This could free otherwise inefficiently deployed personnel for more appropriate duties wherever medical commanders require their special, rare and unique skills.

Importantly, efficient health care, readily available close to the combat should result in improved survival and decreased morbidity from wounds. The strategic implications of high mortality rates and grievously wounded soldiers cannot be discounted. In the current conflict, it is likely the President of the United States has spent more time with medical units than any other type of unit, and press agencies never tire of reporting mortality rates and interviewing our wounded soldiers. Our care of wounded combatants and civilians has strategic implications. Therefore, we should seek to improve our delivery of combat health support whenever possible.

Summary and Conclusion

The AMEDD is tasked with providing combat health service on the battlefield. The United States Army is rapidly becoming a modular, highly mobile force capable of arriving on the battlefield prepared to fight. The purpose of this paper is to determine if the AMEDD needs to be able to field a smaller, more efficient, mobile, modular surgical hospital which can be rapidly deployed and quickly established forward on the battlefield, or if the current medical reengineering initiative combat support hospital possesses the required capability.

In order to determine this, an extensive literature review will be undertaken of recent operations involving the AMEDD as well as personal interviews. A qualitative

analysis of the data will then be undertaken. Chapter 2 of this thesis will be a review of the literature to determine if there is sufficient literature on the subject to allow an analysis of the problem.

¹The Borden Institute, *Textbook of Military Medicine*, part 4, *Surgical Combat Casualty Care, Anesthesia and Perioperative Care of the Combat Casualty* (Washington, DC: Office of the Surgeon General at TMM Publications Borden Institute, 1995), 24.

²John T. Greenwood, “Portable Surgical Hospitals” (Office of Medical History, Office of the Surgeon General, 2004), 4 [article online]; available from <http://history.amedd.army.mil/books/docs>; Internet; accessed 5 November 2004.

³Robert M. Hardaway, *Care of the Wounded in Vietnam* (Manhattan, KS: Sunflower University Press, 1988), 93-100.

⁴The Borden Institute, *Textbook of Military Medicine*, part 4, *Surgical Combat Casualty Care, Anesthesia and Perioperative Care of the Combat Casualty*, xv.

⁵28th Combat Support Hospital, *28th Combat Support Hospital, China Dragons! Operation Iraqi Freedom 10 March 2003-14 February 2004*, 7 (Army Medical Department Lessons Learned, 2004), [report on-line]; available from <http://secure-ll.amedd.army.mil/Reports/>; internet; accessed; 14 November 2004.

⁶212th Mobile Army Surgical Hospital, *212th Mobile Army Surgical Hospital, Operation Iraqi Freedom (21 March-17 April 2003) Lessons Learned*, 1-2 (Army Medical Department Lessons Learned, 2004), [report on-line]; available from <https://secure-ll.amedd.army.mil/Reports/OIF>; internet; accessed 14 November 2004.

⁷28th Combat Support Hospital, 64-69.

⁸The Borden Institute, *Emergency War Surgery* (Washington, DC: Borden Institute Walter Reed Army Medical Center, 2004), 2.1-2.2.

⁹Ibid., 2.2-2.3.

¹⁰Headquarters, Department of the Army, FM 4-02.10, *Theater Hospitalization* (Washington, DC: Headquarters Department of the Army, 2005), 1-4.

¹¹The Borden Institute, *Emergency War Surgery*, 2.9-2.10.

¹²Ibid., 2.10.

¹³Ibid., 2.6-2.7.

¹⁴Ibid., 2.7-2.8.

¹⁵Ibid., 2.10.

¹⁶212th Mobile Army Surgical Hospital, 1-2.

¹⁷The Borden Institute, *Emergency War Surgery*, 2.3.

¹⁸Robert E. Leonard, “The Professional Filler System (PROFIS): Recognized Challenges-Recommended Solutions” (paper, United States Command and General Staff College, Fort Leavenworth, KS, February 2002), 1-8.

¹⁹GlobalSecurity.org, “Brigade Unit of Action,” 10 March 2005. [article on-line]; available from www.globalsecurity.org/military/agency/army/bua.htm; Internet; accessed 2 April 2005.

²⁰Melissa House, “Changing Enemy Contributes to Transformation,” *The Bayonet*, 24 September 2004 [article on-line]; available from www.tradoc.army.mil/pao/TNSArchives/September/093304.htm; Internet; accessed 15 March 2005.

²¹Ibid.

²²Headquarters, Department of the Army, FM 3-0, *Operations* (Washington, DC: Headquarters, Department of the Army, June 2001), 4-25.

²³Ibid., 5-11.

²⁴The Borden Institute, *Emergency War Surgery*, 2.8-2.9.

²⁵The Department of Defense, *The National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2005), 10-16.

CHAPTER 2

LITERATURE REVIEW

Background

The literature cited in this thesis can be grouped into three basic categories. First are historical sources that set the foundation of the evolution of medical treatment delivered to United States ground forces, and second, doctrinal manuals and publications explain the intended use of modern Army medical units. The third category includes personal and official after-action reviews and articles written during and immediately after recent combat operations.

The works cited in this thesis fall into three main types. They are books, published after action reviews, and government documents, such as field manuals. The books cited in this thesis serve mainly to provide a historical context. They are useful because they provide examples of how the medical field has provided medical care in previous conflicts, and thus serve as foundational sources. The majority of the historical sources are used in chapter 4, which reviews the history of Army medicine in some detail. The field manuals and similar government publications also serve as foundational documents by defining medical doctrine and current tactics, techniques, and procedures which can then be contrasted against the actual use of medical units in recent operations. The after-action reviews serve as a primary basis of the case studies that will be undertaken in chapter 5. After-action reviews cited are from the AMEDD Lessons Learned Web Site. The site is for official use only, but the material used in this research is not classified and can be used in this thesis without limitation. The author talked with the web site NCO who confirmed the material on the web site was not classified or copyright protected, and

could be cited without limitations. The after-action reviews are available at the Army Medical Department's secure web site. U.S. Government documents can be referenced through Army Knowledge Online. All other sources are public.

The purpose of this chapter is to demonstrate that adequate current material is available to determine if the current configuration of the level III combat support hospital is appropriate for the modern battlefield and the contemporary operating environment or if changes are required. The literature cited in this chapter is discussed to demonstrate the level of research conducted, but does not attempt to include every resource researched. The historical sources will be covered briefly as they are extensively cited in chapter 4. At the end of this chapter, the reader should have an understanding of the available applicable medical doctrine and the rather extensive amount of recent after action reviews that have evaluated the performance of medical care and level III hospitals in recent operations.

Historical Resources

Encyclopedia of the American Military Studies of the History, Traditions, Policies, Institutions, and Roles of the Armed Forces in War and Peace by John E. Jessup and Louie B. Ketz is a three volume series that includes a comprehensive chapter on the medical care provided to United States military forces from the Revolution through Vietnam.¹ It contributes a historical foundation of the medical care provided, the evolution of military medical care, and the medical units that have been employed in America's battles.

From 1921 to 1929, The Army Medical Department under the direction of the Surgeon General, Merritte W. Ireland, prepared a 15 volume series called *The Medical*

Department of the United States in the World War. This work provides a thorough description of Army medicine in World War I and is an excellent foundational work that describes in detail the battlefield organization that effectively supported American forces in World War I.²

The Office of Medical History, Office of the Surgeon General maintains a web site that also provides excellent historical foundational resources. One of these, *United States Army, Report of Operations 20 October 1943-1 August 1944*, describes the employment of medical forces during World War II in the European Theater. It includes descriptions of field, convalescent, and evacuation hospitals and their employment. It is a valuable foundational piece that contributes to an understanding of the evolution of Army hospitals to support the more mobile warfare developed in World War II.³

The Office of Medical History, Office of the Surgeon General provided another excellent report, “Portable Surgical Hospitals”. This article describes the formation of small hospitals that could be more easily transported to support warfare in the jungle island battles of the World War II Pacific Theater. These hospitals are important precursors of the mobile army surgical hospitals that would be used in the Korean War. This is an important foundational point as it shows the historical evolution to a smaller, mobile hospital capable of providing level III medical care. Successful prior implementation of this type of hospital in a previous conflict requiring mobility contributes significantly to the argument that a similar unit will be required in future mobile warfare.⁴

Mary E. Condon-Rall and Albert E. Cowdrey in *United States Army in World War II, The Technical Services, The Medical Department: Medical Service in the War*

Against Japan also provide compelling histories of the evolution of surgical hospitals in WWII. It is another fine example of the excellent work the Army and the medical department has done documenting their histories during the World Wars. This work is valuable to anyone trying to develop a strategic vision for future medical care. It is replete with lessons learned in a variety of combat environments, and includes vital information on the required command structure, types of units, and care required in a previous complex medical theater.⁵

A similar work by Graham A. Cosmas and Albert E. Cowdrey, *U.S. Army in World War II, The Technical Services, The Medical Department: Medical Services in the European Theater of Operations* provides similar background on the European Theater in WWII.⁶

Albert E. Cowdrey in the *United States Army in the Korean War, The Medics' War*, and Headquarters, 45th Mobile Army Surgical Hospital in its *History of the 8067th Army Unit, Mobile Army Surgical Hospital (19 July 1950-31 January 1953) and 45th Surgical Hospital, Mobile Army* from the Office of Medical History, Office of the Surgeon General describe the response of the medical services to the desperate situations that existed during the Korean War and document the extremely valuable contribution of level III capable hospitals which provided their own transportation. These hospitals may represent a historical model of flexibility and mobility that the Army Medical Department could draw upon for a future level III hospital.⁷

Surgeon General, a former Surgeon General of the Army during the Vietnam War, in the report *Medical Support of the U.S. Army in Vietnam 1965-1970* summarizes the medical command, patient care, hospitalization, and evacuation found in the Vietnam

War. This report characterizes the type of medical support required for insurgency operations, and includes descriptions of evacuation hospitals, and convalescent hospitals. This work describes the requirement that arose during the Vietnam War for mobile surgical hospitals to support offensive operations remote from the fixed hospitals found in base camps.⁸

Retired Brigadier General and Surgeon Robert M. Hardaway in his book *Care of the Wounded in Vietnam* gives a detailed account of the sophisticated medical system that was developed and provided to wounded soldiers in Vietnam. General Hardaway's work makes a significant foundational contribution to this thesis.⁹

Literary resources for Operations Desert Storm and Shield are limited, however The Surgeon General of the Army at the time Lieutenant General Frank F. Ledford in *From the Surgeon General of the Army, Medical Support for Operation Desert Storm*" *The Journal of the US Army Medical Department* describes the care available in Operation Desert Storm and Shield. Significantly, the implementation of the Deployable Medical System (DEPMEDS) hospitals gave large hospitals partial mobility.¹⁰

Current Army Medical Doctrine

Field Manual 8-10-14 Employment of the Combat Support Hospital Tactics, Techniques, and Procedures is important as a foundational work because it defines the doctrine of the 296-bed combat support hospital. The majority of combat support hospitals used in Operation Iraqi Freedom were trained and designed for employment using the FM 8-10-14 doctrine that did not include split-based operations or early entry packages.

Field Manual 4-02.10 Theater Hospitalization is new doctrine available as of January 2005. This manual explains the role of the 248-bed combat support hospital in its two doctrinal configurations. The first is the corps hospital that is comprised of two functional modules. One is an 84-bed hospital that includes an early entry 44-bed module that is capable of organic movement. The second module is a 184-bed hospital that is capable of independent operation, but is not mobile. FM 4-02.10 states that the 184-bed company is capable of independent operations for 72 hours without supply. Split based operations are doctrinal reality for the corps CSH.¹¹ The echelon above corps combat support hospital (EAC CSH) is similar to the corps CSH. It comprises 248 beds with an 84-bed company capable of independent deployment, but the 164-bed company cannot be employed separate from the 84-bed company.¹²

Field Manual 8-55 Planning for Health Service Support provides foundational information on the Medical Force 2000 hospitals including the 296-bed combat support hospitals that comprised the majority of the level III hospitals in Iraq during Operation Iraqi Freedom I. It specifically addresses mission, capabilities, mobility and basis of allocation.

Emergency War Surgery, Third United States Revision produced by the Borden Institute at Walter Reed Army Medical Center in Washington, DC is principally a medical procedures textbook for common wounds inflicted during combat operations. However, it also provides valuable information on the five levels of medical care including the level III capabilities of the US Army, Air Force and Navy.¹³ It represents the most current doctrine in this respect as it was published and distributed in December 2004.

Field Manual 4-02.25 Employment of Forward Surgical Teams Tactics, Techniques and Procedures provides foundational information on the forward surgical teams that are important level II assets that have sometimes been used in lieu of level III hospitals in certain combat operations like Operation Enduring Freedom in Afghanistan.

Case Study Sources

A RAND report obtained from the Rand Web Site titled *Army Medical Support for Peace Operations and Humanitarian Assistance* by Lois M. Davis, Susan D. Hosek, Michael G. Tate and others evaluates the performance of the Army Medical Department in Military Operations Other Than War (MOOTW) by performing case studies of the medical mission in Operation Provide Promise in the Balkans and Operations Restore and Continue Hope in Somalia. The purpose of the RAND report is to determine the unique requirements and expanded mission of MOOTW. This case study includes information on the types of hospitals deployed, their missions, type of casualties cared for, and personnel requirements.

Paula C. Lodi in her monogram “The Army Medical Department and Full Spectrum Operations” written for the School of Advanced Military Studies, United States Command and General Staff College at Fort Leavenworth, KS considers the MOOTW mission and the flexibility and modularity of the current level III hospitals. This paper studies Operations Provide Comfort, Provide Promise, Restore Hope, Allied Force, and Enduring Freedom. Based on her findings, the author recommends a smaller, mobile level III hospital and the appropriate unit to support full spectrum operations.¹⁴

Alan L. Moloff and Susan Denny in their article “The Contingency Medical Force, Chronic Challenge, New Solution” report on their experience with the 212th

Mobile Army Surgical Hospital (MASH) with Task Force Hawk in Albania. They successfully provided level III medical support to a brigade sized combat team for several months using the MASH organization that is 100 percent mobile and much smaller than the combat support hospital.

The Army Medical Department Lessons Learned Web Site is the source of the *General Officer Out-brief Report, Operation Enduring Freedom Medical AAR (25 October 2002)* which among other things discusses the problems of using forward surgical teams as level III combat health support.¹⁵

COL John Holcomb in a fragmentary order posted at the Army Medical Department Lessons Learned Web Site called “Optimal Use of Level II and III Assets in OIF-2, 4 June 2004” states the limited capabilities of the forward surgical teams precludes their use for surgery unless the combat support hospitals are more than three hours away. COL Holcomb justifies this action based on medical historical data and Operation Iraqi Freedom outcomes.¹⁶

The 212th Mobile Army Surgical Hospital in its after-action report *Operation Iraqi Freedom (21 March-17 April 2003) Lessons Learned* found at the Army Medical Department Lessons Learned Web Site reports their experience in Operation Iraqi Freedom I. Their review is comprehensive and includes command and control, operations, personnel, medical regulating, logistics, maintenance, and clinical operations. The 212th MASH’s after action review details the remarkable success of a unit that trained for its doctrinal mission and then performed it. They report their share of problems, but few of them were organic unit based problems.

Mark A. Meeks an anesthesiologist with the 86th Combat Support Hospital in his personal contribution “After Action Review of MAJ Mark A. Meeks, 86th Combat Support Hospital, Operation Iraqi Freedom,” 29 September 03 found at the AMEDD Web Site describes the difficulty his CSH encountered in the maneuver phase of OIF I and how they attempted to overcome those difficulties by creating ad-hoc organizations capable of moving surgical support forward.

After a year in Iraq, the 28th Combat Support Hospital published their after action review on the AMEDD Web Site titled the *28th Combat Support Hospital, China Dragons! Operation Iraqi Freedom 10 March 2003-14 February 2004*. This report discusses many of the problems the hospital encountered. They discuss split based operations, patient care, mobility, and many other problems they encountered while serving as the main combat support hospital during Operation Iraqi Freedom. The report is very detailed and includes chapters from multiple hospital sections and extensive data on the patients they cared for including the number and types of surgeries.

During Operation Iraqi Freedom I, the Surgeon General of the Army dispatched four senior colonels to the theater to assess combat health care. The Colonels were specialists in General Surgery, Trauma Surgery, Orthopedic Surgery and Anesthesiology. Their comments are succinctly made in a document titled *Office of the Surgeon General Surgical AAR Team* and is published at the AMEDD Web Site. Their observations include comments on the deployability of the combat support hospitals and the staffing of those hospitals.

Another senior colonel and cardiothoracic surgeon, Dr. David J. Cohen reported on his experience with a forward surgical team and a combat support hospital in “After

Action Report on Deployment to Iraq: Role of the Combat Support Hospital" at the AMEDD Web Site. COL Cohen's observations include positive comments on split-based operations of the combat support hospital.

Many more personal and after action reviews are available online at [http://secure-il.amedd.army.mil/ Reports/OIF/](http://secure-il.amedd.army.mil/Reports/OIF/). Additionally, the internal unpublished after action review of the 21st CSH, the only 248-bed MRI CSH, has been made available to the author.

Conclusion

The literature reviewed and presented in this chapter demonstrates that adequate literature has been published on recent medical operations in support of major military operations and stability operations to allow for case study analysis of these operations. The literature presented in this chapter will be evaluated in depth in the following chapter to determine if the combat support hospital is appropriately organized and equipped to support the brigade combat teams, UEx, and UEy units planned for the future. Importantly, mobility and modularity or the flexibility to expand to meet changing mission requirements will be explored.

¹John E. Jessup, and Louise B. Ketz, eds., *Encyclopedia of the American Military*, vol. 3, *Studies of the History, Traditions, Policies, Institutions, and Roles of the Armed Forces in War and Peace* (New York: Charles Scribner's Sons Macmillan Publishing Company, 1994), 1575-1625.

²Charles Lynch, Frank W. Weed, and Loy McAfee, *The Medical Department of the United States Army in the World War*, vol. VIII, *Field Operations* (Washington, DC: Government Printing Office, 1925).

³First United States Army, *Report of Operations 20 October 1943-1 August 1944*, 61-65 (Office of Medical History, Office of the Surgeon General, 2004), [report online]; available from <http://history.amedd.army.mil/>; internet; accessed; 8 November 2004.

⁴John T. Greenwood, “Portable Surgical Hospitals” (Office of Medical History, Office of the Surgeon General, 2004), [article online]; available from <http://history.amedd.army.mil/books/docs>; internet; accessed 5 November 2004.

⁵Mary E. Condon-Rall and Albert E. Cowdrey, *United States Army in World War II, The Technical Services, The Medical Department: Medical Service in the War Against Japan*, (Washington, DC: U.S. Government Printing Office, 1998).

⁶Graham A. Cosmas and Albert E. Cowdrey, *U.S. Army in World War II, The Technical Services, The Medical Department: Medical Services in the European Theater of Operations* (Washington, DC: U.S. Government Printing Office, 1991).

⁷Albert E. Cowdrey, *United States Army in the Korean War, The Medics' War* (Washington, DC: U.S. Government Printing Office, 1987).

⁸Spurgeon Neel, *Medical Support of the U.S. Army in Vietnam 1965-1970* (Washington: U.S. Government Printing Office, 1973).

⁹Robert M. Hardaway, *Care of the Wounded in Vietnam* (Manhattan, KS: Sunflower University Press, 1988).

¹⁰Frank F. Ledford, “From the Surgeon General of the Army, Medical Support for Operation Desert Storm” *The Journal of the US Army Medical Department*, (Jan/Feb 1992).

¹¹Headquarters Department of the Army, FM 4-02.10, *Theater Hospitalization* (Washington, DC: Headquarters Department of the Army, 2005), 2-22-2-28.

¹²Ibid., 2-2.

¹³The Borden Institute. *Emergency War Surgery* (Washington, DC: Borden Institute Walter Reed Army Medical Center, 2004), 2.1-2.10.

¹⁴Paula C. Lodi, *The Army Medical Department and Full Spectrum Operations*, (Monogram, School of Advanced Military Studies, United States Command and General Staff College), Fort Leavenworth, KS Feb, 2002, 41-47.

¹⁵Office of the Surgeon General, *General Officer Out-Brief Report: Operation Enduring Freedom Medical AAR (25 October 2002)*, (Army Medical Department Lessons Learned, 2004) [report online]; available from <https://secure-ll.amedd.army.mil/Reports/>; internet; accessed 10 November 2004.

¹⁶John Holcomb, FRAGO# XXX, “Optimal Use of Level II and III Assets in OIF, 4 June 2004” (Army Medical Department Lessons Learned, 2004) [article online]; available from <http://secure-ll.amedd.army.mil/Reports/OIF>; internet; accessed 5 November 2004.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction and Motivation

The author's motivation for researching this topic was inspired by observations made while deployed with the 10th Combat Support Hospital and the 28th Combat Support Hospital during Operation Iraqi Freedom from February 2003 through October of 2003. The rapid advance of combat forces in phase III operations made it very difficult for the combat support hospitals to support the maneuver operations. The 10th CSH was not employed as a hospital. Instead, its equipment and personnel were redistributed to two other combat support hospitals in order to make them mobile enough to move forward and then to allow them to have adequate personnel and equipment to provide non-doctrinal split based operations.

Preliminary research into the topic of level III care revealed only one significant paper in the past ten years on the level III hospital. Paula C. Lodi in her monogram "The Army Medical Department and Full Spectrum Operations" written for the School of Advanced Military Studies, United States Command and General Staff College at Fort Leavenworth, KS considered the MOOTW mission and the flexibility and modularity of the current level III hospitals. Lodi's article is a comprehensive review, but covers operations that generally produced few combat injuries, and the article was written before Operation Iraqi Freedom.¹

Combat operations in Iraq have produced significant numbers of casualties. This required a shift away from small-scale operations and MOOTW back to the more traditional mission of caring for combat wounds, non-battle injuries, and combat stress

patients. The author's experience in Iraq suggests the current level III hospital needs improvement. The research should determine if the author's experience was unique, or if the level III hospital has systemic problems that require a new approach. Once again, based on the recent performance of the Army Medical Departments combat health support on the battlefield, the primary research question is how should the AMEDD provide Level III, and level IV combat health support to the unit of action (brigade combat team), UEEx (future division/corps), and UEEy (future corps/army)? Secondary research questions that will be addressed include:

1. What is an effective functional core module for a level III facility?
2. How can the hospital be modularly expanded?
3. What is the mobility requirement?
4. What is the role for a level IV facility?

Qualitative Analysis

This thesis generally follows the format recommended by the Director of Graduate Degree Programs, US Army Command and General Staff College.² The thesis research method will be a qualitative analysis. This thesis is ideally suited for qualitative analysis because it is “field focused, interpretive in scope, geared toward specifics and detail, and grounded in future utility.”³ The research will include “in-depth open ended interviews, direct observation, and written documents.”⁴ The case study method involves in-depth probing of a single phenomenon or situation. In this case that phenomenon will be level III combat health support as it occurred in several recent operations. Cross case comparison of various hospitals in several operations will be performed using documents, archival records, and interviews of participants. The purpose of this case study is to

review the nature of selected medical operations in the past decade to determine the capabilities and shortfalls of the current level III hospital. The case study analysis will be conducted chronologically by operation starting with Operation Provide Comfort, including Operations Restore Hope, Operation Allied Force, Operation Enduring Freedom, and concluding with Operation Iraqi Freedom.

Format

Chapter 1 is an introduction to the topic and introduces the primary and secondary research questions. Chapter 1 also describes the necessary assumptions, defines operational terms, provides the limitations of the thesis, and describes why the research is important. Chapter 2 reviews the available literature and determines sufficient literature is available to allow the research of the topic. The type of literature evaluated includes historical resources, Army medical doctrine, and case study sources. Chapter 3 explains the research methodology and introduces the author's motivation, restates the research question, explains the research method, outlines the thesis format, and explains the desired product of the analysis and results chapters. Chapter 4 deviates slightly from the standard thesis format, and describes the history of the Army Medical Department. The historical role of the AMEDD provides a foundation for understanding possible future requirements. It also allows for a determination of what requirements have changed, and how future AMEDD units will need to change to support future operations. Chapter 5 will present the case study analysis, personal interviews and the author's observations. In chapter 6, recommendations will be based upon the conclusions drawn from the analysis of the data.

Purpose of Analysis

The purpose of the analysis in chapter 5 is to determine the desired capabilities of the level III hospitals based on recent operations including operations ranging from smaller scale contingencies to major combat operations, and to determine the shortfalls of the current level III hospital structures. In Chapter 6, Results and Recommendation, once the desired capabilities have been elucidated and the deficiencies identified, the current combat support hospitals, mobile army surgical hospitals, and the practice of organizing medical tasks forced will be compared. If warranted, a new model will be recommended which will attempt to integrate all of the desired capabilities based on case studies, interviews, and the author's direct experience in Operation Iraq Freedom.

Conclusion

The research methodology chosen and presented in this chapter demonstrates a methodical approach to the problem by introducing the topic and research questions and then demonstrating sufficient literature exists to proceed with the research. The qualitative research method has been demonstrated to be the appropriate approach to this research. Subsequent chapters will provide historical perspective, data collection and analysis and results and recommendations.

¹Paula C. Lodi, "The Army Medical Department and Full Spectrum Operations" (School of Advanced Military Studies, United States Command and General Staff College, Fort Leavenworth, KS Feb, 2002).

²CGSC Student Text 20-10, *Master of Military Art and Science (MMAS) Research and Thesis*, (U.S. Army Command and General Staff College, Fort Leavenworth, 2004).

³Michael Eisener, *The Enlightened Eye: Qualitative Inquiry and the Enhancement of Educational Practice*, (New York: McMillan Publishing Co.,1991), 32-39.

⁴Michael Quinn Patton, *Qualitative Evaluation and Research Methods*, (Newbury Park, NY: Sage Publications, 1990), 10.

CHAPTER 4

ARMY MEDICAL DEPARTMENT HISTORY

Introduction

In order to understand why the level III combat support hospitals are so large and relatively fixed, it is useful to review the history of the United States Medical Corps, and to understand its significant contribution in America's wars.

American Revolution

The American Revolutionary War was a difficult challenge for physicians. The training of the doctors was not standardized and generally consisted of an apprenticeship. Even the best trained were limited in their capabilities. Drugs were virtually non-existent and surgery was extremely rare and dangerous with high infection rates. No anesthesia was available, and the understanding of anatomy was limited. Cauterization using a hot iron was the preferred method for stopping bleeding.¹

The hospital system was irregular and usually consisted of regimental hospitals and larger general hospitals. Generally, the hospital served as a place to send the ill before the battle. After the battle, the physicians did their best to care for wounded soldiers with limited resources. Supply was a problem. No medical organization existed and few resources were allocated to the hospitals. No officers or enlisted personnel were designated to be specifically assigned to the hospitals.

The majority of patients encountered were sick from disease, and most deaths were from disease. American forces were forced to withdraw from Montreal in 1776 in part because 50 percent of the U.S. expeditionary soldiers contracted small pox. In the revolutionary period small pox inoculation was possible, and General George

Washington ordered it on a large scale when faced with epidemics of the disease. The large-scale administration of small pox inoculations was a major accomplishment of military medicine in the Revolution.²

Civil War Medicine

The major accomplishment of Civil War medicine approximately eighty years later was not in medical or surgical advances, but improved medical and logistic organization. The dead and wounded at the Battle of Manassas were both beyond anyone's experience and unexpected. The meager medical assets available were quickly overwhelmed. This massive failure of the medical system, and the political pressure which followed, led to real reform that included sanitary measures and inspectors, but also included battlefield organization first implemented by Dr. (Major) Jonathon Letterman.³

The reforms instituted by Letterman for the Army of the Potomac produced the first medical organization fielded by a United States Army. For the first time, enlisted personnel and non-physician officers were assigned as medical personnel. The ambulance corps was created and commanded by a captain at the Army corps level, a first lieutenant at the division level, a second lieutenant at the brigade level and a sergeant at the regimental level. Each regiment received one transport cart, one 4-horse cart, and two 2-horse carts with the soldiers and support troops required. These resources were dedicated to evacuation of the wounded.⁴

Hospital organization at the beginning of the Civil War was basic and generally consisted of regimental hospitals staffed by poorly trained regimental surgeons. Field hospitals were organized further from the battle and frequently consisted of a single

confiscated building with patients placed outside to await care. General hospitals were found farther back near population centers. From these humble beginnings, the Union Army developed a sophisticated hospital system that consisted of division and corps field hospitals and large pavilion general hospitals. General hospitals had individual wards for segregating patients with different types of illnesses and injuries. The injured men were evacuated from forward hospitals to the general hospitals to make room for anticipated battle casualties. The Union Medical Department at its pinnacle had 204 general hospitals with beds for 136,894 patients.⁵

Training also improved as the Civil War went on. The best surgeons were identified and moved to centrally located hospitals; thereafter, they were the only doctors allowed to perform surgery. Thus, the Civil War saw the beginning of medical specialization.⁶

In contrast to the Civil War, great medical and surgical progress was made in the years leading up to World War I. The germ theory had been proven, and immunizations for diseases such as typhoid and tetanus were available. The importance of sanitary practice was understood and appropriate measures were widely implemented. Great advances in surgery had occurred, including the ability to perform abdominal, thoracic, and neurosurgery. The Army established a reserve corps of physicians and nurses. Many of them were well educated and nationally recognized in their medical fields. Importantly, the positions of corpsman and medical steward were now part of the military organization.⁷

World War I Medical Care

When the United States entered World War I in 1917, it took with it an excellent medical capability largely comprised of reserve doctors and nurses who brought the high standards of civilian medical care with them. The relatively fixed nature of the front in WWI facilitated the establishment of large evacuation hospitals with 1000 beds each. Field hospitals were located closer to the front line, but were only used to stabilize the wounded. However, a few mobile surgical hospitals were placed near the front for those whose injuries could not wait to be moved to the evacuation hospitals.⁸ Corpsmen were placed in the front line and moved patients by litter to battalion aid stations. The ambulance corps moved patients between all of these echelons. Though not formally organized as such, we see in WWI organization all the modern 5 echelons of medical evacuation.

World War I produced casualties on a massive scale. The American Expeditionary Forces were supported by 30 evacuation hospitals and often that was not enough. Triage, the concept of sorting patients by the urgency of their surgical need, was invented by the French and adopted by the Americans in WWI.⁹ Since the Americans could not easily remove patients efficiently from the theater, the best care possible was brought to the battlefield. This philosophy would persist for more than 50 years through the Vietnam War.

World War I was a watershed in the Army Medical System, and medicine and surgery continued to advance in the years leading up to WWII. The antibiotic penicillin was available to fight infection and blood transfusions were now available to treat blood

loss and shock. Surgeons of all types were available to provide life saving surgeries to wounded soldiers.

World War II Medical Care

During WWII, most surgical capability was again located in the evacuation hospital. The evacuation hospital was smaller in World War II, but still generally consisted of 400 beds. The United States 1st Army in preparation for the Normandy invasion had ten 400-bed evacuation hospitals and one 750-bed evacuation hospital. It also had five small field hospitals, which were typically non-surgical and farther forward, for resuscitation.¹⁰

The amphibious assaults conducted in WWII presented unique challenges for delivering medical care. Initially, wounded soldiers were evacuated from the beaches to hospital ships off shore. As soon as practical, the evacuation hospitals were brought forward, but this could take several days. In the European theater 4-6 man auxiliary surgical teams were created to accompany the frontline troops.¹¹

The Pacific theater required a more dramatic solution. In Papua and New Guinea, the terrain and dense jungle mandated small regimental and battalion size operations. Much of the re-supply was by air, conditions were very austere, and deployment and support of evacuation hospitals was not possible. The soldiers in these battles needed surgeons nearby and the solution was the portable surgical hospital created out of necessity by Chief Surgeon Southwest Pacific Area, Colonel Percy J. Carroll. These hospitals were small, light, and self-contained hospitals with approximately 25-beds. They were staffed with 3 general surgeons, an anesthesiologist, and 25 enlisted personnel. These units were intended to bridge the gap until the larger hospitals could be

deployed, but they were so successful they were officially adopted and eventually used in both theaters. A total of 103 portable surgical hospitals were used in WWII, and the advantages of this light mobile surgical capability were clear.¹² The following quote gives an idea of the operating conditions in which the portable surgical hospitals were used:

From the battalion aid stations, relay teams carried the wounded 800-1200 yards back over twisting trails to collecting stations and portable surgical hospitals, often housed in shelters of leaves cut from the jungle, where they received additional treatment. Casualties were sorted; ideally, those needing immediate surgery went directly to the portables, while those not so seriously wounded or too ill to remain near the front were sent to clearing stations, usually 2 miles farther to the rear. Though Carroll had intended portables to be divisional units, in this campaign they were attached to the regimental combat teams and worked in the regimental areas.

Hard labor and danger were the lot of the staffs. The four officers and twenty-five enlisted men of the 3rd Portable Surgical Hospital . . . carried their 1,250 pounds of equipment in pack frames to the front near Buna. Here they set up close to regimental collecting station, forward of the command post and only 300 yards from the Japanese. Sheltered by tents . . . the hospital occupied a hollow, shielded by tall black rubber trees and the luxuriant vegetation of the swamps. The surgeons worked exactly as Carroll intended (a rare occurrence on Papua), providing emergency stabilizing treatment . . . during a single week-its first on the line-the tiny hospital performed sixty-seven major surgical procedures, including amputations, resections of the bowel, and serious chest operations.¹³

The experiences these hospitals gained led directly to the creation of the 60-bed mobile army surgical hospital that would become famous in the Korean War, as the “MASH.”¹⁴

Korean War Medical Care

The Korean War began unexpectedly in June of 1950 and, like the rest of the Army, the Army Medical Department had been significantly reduced in size and was unprepared. With little time and few transportation assets, the Eighth Army Surgeon chose the mobile army surgical hospitals to immediately support the war in Korea. The

MASH was completely mobile and able to be broken down and moved in 6 hours. It was dedicated to surgery, with little capacity to care for other types of patients. It was equipped with basic X-ray and pharmacy capability. These hospitals operated very close to the front lines and moved repeatedly, especially during the first year of the Korean War.¹⁵

This excerpt from the after action report of the 8067th MASH explains the situation:

After being in Kunuri for only six days, the order to “bug out” was given on the 28th of November, and accordingly the hospital loaded up and moved at 1600 hours. Because of the pressing nature of the tactical situation then, not all of the patients were able to be evacuated simply because there were not enough ambulances to carry them out, and as a result about 40 of the patients, one of the doctors and several of the corpsmen were left behind to a somewhat uncertain fate since the Chinese were advancing with such speed that all of the roads and highways were clogged with retreating U.N. personnel and equipment. Fortunately, help was gotten to rescue the stranded patients with the doctor and corpsmen, so none of the personnel were killed or taken prisoners.

It was on the “bug out” from Kunuri (four hours before CCF) that the MASH experienced its nearest disaster. Orders had been given Lt. Col. Van Buskirk to withdraw to Pyong-yang, the North Korean capitol by a certain route. However on reaching the forks in the road where the convoy was supposed to go left, Col. Van Buskirk decided that the route was unsafe and instead took the right fork, which is quite fortunate because all the troops and convoys which took the left fork were trapped in a road block with almost 100% of them either being killed or taken prisoners.

The unit arrived at Pyong-yang at 0200 and took over 1,000 casualties from the 171 evacuation hospital which had been forced to retreat. . . . The hospital remained at Pyong-yang for four days only before it was forced to retreat southward to Kaesong, the old site of the truce talks. At Kaesong they stayed only a week leaving there at 1530 on the 10th of December, again “bugging out,” this time to Suwon for the second time. . . . The first Christmas and New Years Day were spent in Suwon while the front stabilized a bit, but again the U.N. Forces were forced to retreat and this time the hospital with drew still further south to Taejon, setting up only to have to breakdown again after a few hours and go to Sanju on an overnight move arriving 6 January.¹⁶

The surgeons were almost uniformly under-trained, many were still residents, and the conditions were terrible, but the concept of the organization was sound as the MASH

moved with the division it supported and provided needed surgery close to the front on a battlefield dominated by the need to maneuver quickly.¹⁷ A major innovation in medical treatment in Korea was increased helicopter medical evacuation. The terrain in Korea was extremely restrictive, and innovative helicopter rescues led to the formation of permanent medical evacuation units. The MASH also demonstrated its versatility during offensive operations by advancing with the attacking divisions and coming ashore at Inchon.¹⁸

Evacuation and field hospitals were also important in Korea. The evacuation hospitals were semi-mobile with up to 1000 hospital beds and medical and surgical capabilities. Thoracic and abdominal surgeries were commonly done and medical patients with dysentery, hepatitis and malaria were treated. The field hospitals were larger and farther back than the evacuation hospitals, but were closely related in their capabilities.¹⁹

The typical evacuation chain developed in Korea was the echelon I medic and battalion aid station, echelon II medical clearing company, echelon III MASH, echelon IV evacuation hospital, and the echelon V station hospital (Japan), Tripler Hospital (Hawaii) and finally the United States. The five echelons of evacuation used today were all present, although that terminology was not used in Korea.²⁰

The MASH was the critical element in the success of the medical department during the Korea War. When the Army needed a mobile and flexible surgical capability to support dynamic operations, the MASH was able to deliver. Without its mobility and flexibility, surgical care would have been delayed with the consequence of greater loss of life.

In Korea, as the situation stabilized, the MASH often would begin to take on the characteristics of a fixed hospital. Semi-permanent facilities were built and bed capacity was expanded as well as more sophisticated capabilities added. However, when the war demanded, these facilities and add-ons could be left behind and the hospital could rapidly move to support the next mission.²¹ This was the model for the next large conflict when again, the AMEDD would again sacrifice mobility in favor of more complex treatment facilities to support another relatively fixed battlefield situation.

Vietnam Medical Care

Vietnam was a mobile war usually fought from fixed base camps that were relatively secure. The ability to use the helicopter to rapidly insert troops and remove them gave the American forces in Vietnam great agility. Movement on the ground; however, was restricted by terrain and the nature of the insurgent warfare. Concurrently, the helicopter was being further developed as a medical evacuation asset.²² The wounded were usually brought to army hospitals located in base camps by helicopter. These hospitals rarely moved and as such grew to be large with sophisticated medical and surgical capabilities. The types of hospitals used in Vietnam included surgical hospitals, field hospitals, evacuation hospitals and a convalescence hospital.²³ The convalescence hospital mainly treated illness such as malaria and hepatitis in order to keep patients in Vietnam to recover.²⁴

The idea of medical mobility in Vietnam was, with the exception of two surgical hospitals, abandoned in favor of relatively fixed hospitals with modern equipment and facilities capable of delivering care almost equivalent to hospitals found in the United States. The medical unit self-contained and transportable hospitals (MUST) were an

attempt to improve on the tent hospitals of the past and were a combination of a “the expandable surgical element . . . with rigid accordion sides, the air inflatable ward element was a double-walled fabric shelter providing a free-space area for ward facilities. The utility element or power package contained a multifuel gas turbine engine which supplied electric power for air conditioning, refrigeration, air heating and circulation, water heating and pumping, air pressure for the inflatable elements, and compressed air or suction.”²⁵ These hospitals were found to have many problems and, except for the two surgical hospitals required to maintain some mobility, were abandoned in favor of construction of virtually permanent facilities.²⁶

With helicopters and advanced surgical capabilities, the medical system in Vietnam achieved survival rates unequaled before on the battlefield. A patient wounded in Vietnam could arrive at a fully equipped modern American hospital in minutes, receive blood and fluids in a modern emergency department, go to surgery, and undergo a vascular repair of a major artery or similar injury. The full range of critical care medicines and treatment were frequently available in the same facility where the patient received surgery, or at worst were a short helicopter ride away.²⁷

The success in Vietnam would challenge the Army Medical Department to achieve the same results in future conflicts under often very different operational conditions. The challenge of providing medical and surgical care near the battlefield nearly matching the care provided at a large fixed American hospital, while maintaining the mobility and flexibility needed to accompany maneuver combat forces was, and is, a difficult challenge.

The AMEDD solution was to create the deployable medical unit (DEPMED). These facilities were aluminum-framed tents that could be assembled in series and included expandable metal surgical suites. Radiology, lab, pharmacy, an emergency medical tent, intensive care wards, and regular wards were also normally included. The hospital was largely self-sufficient with a dining facility, maintenance and laundry facility.

The field and general hospitals were staffed with sub-specialists in surgery and were also staffed with medical specialists. These hospitals were intended to be located in theater but farther back in the communication zone. The combat support hospital was smaller with 296-beds and 8 operating tables built around a general surgery and orthopedic surgery capability. The hospital could be set up in 72 hours, and was meant to be 35 percent mobile.²⁸

Operation Desert Storm Medical Care

When the Persian Gulf War began in 1991, the AMEDD had not fielded the DEPMEDS capabilities to all of its hospitals. It was however, able to convert all of the hospitals in theater to DEPMEDS before the ground war. Operation Desert Storm and Shield were large-scale conventional operations. The Army had, at the peak of operations, 44 hospitals including MASH, CSH, and field hospitals in Southwest Asia. They also fielded for the first time 100 percent mobile, 20-man forward surgical teams each comprised of three general surgeons, one orthopedic surgeon and two anesthetists. There were abundant logistical resources in this operation. This allowed some hospitals to be loaded on trucks ready to move forward while other hospitals were already set up in

Saudi Arabia ready to treat casualties. The AMEDD was able to set up a total of 13,000 beds at its peak for Operation Desert Storm.²⁹

The DEPMEDS system seemed to strike a workable balance between size and mobility in the Operation Desert Shield and Operation Desert Storm. These hospitals could be taken down, moved, and set up in 72 hours. They required division or corps assets to move while other hospitals already operating covered the move. However, the success of this large-scale operation did not mean the AMEDD was ready for the change in the operational landscape.

Medical Care in Smaller-Scale Operations

Smaller-scale contingency operations would become the prevailing challenge after Operation Desert Storm, and complex operations in Somalia, Bosnia, Kosovo, and Haiti would characterize medical and military operations. These operations challenged the traditional role of military medicine. The organization of the CSH, evacuation hospitals, and field hospitals were ill suited for stability operations and military operations other than war. These operations often had a humanitarian component, and often the traditional mix of surgeons and preventative medicine doctors was inappropriate for the emerging ill-defined missions. To compensate for this, hospitals attempted to tailor their mission by selectively deploying parts of their hospital and augmenting shortage areas.³⁰

Because U.S. Army casualties were few, this approach was generally adequate. The AMEDD had recognized the need for a more mobile level III hospital as a consequence of Operation Desert Storm, and attempted to integrate the lessons learned from the small-scale operations it was more and more frequently required to support. The

medical reengineering initiative combat support hospital (MRI CSH) was one result. The MRI CSH divided the hospital into two smaller component hospitals. The smaller 84-bed hospital is meant to be largely mobile, and the larger 164-bed hospital can follow later to complete the 248-bed hospital. Doctrinally, either of these sections could operate independently for a short period of time while the other section moved. It also made it possible for a smaller hospital to be readily available for smaller contingencies. However, the MRI CSH still requires help to move. It is possible to move a 44-bed portion of the hospital with organic assets. The 164-bed section cannot be easily moved without division or corps assets.³¹

In the period leading up to Operation Iraqi Freedom (OIF), the Army reduced its transportation capability, and in OIF there were no corps assets made available to move the combat support hospitals.³² This led to a frantic effort, in the field, during the ground combat in Iraq by medical commanders, to reorganize the combat support hospitals into units that could move themselves and provide level III care forward. By combining the organic assets available among the combat support hospitals in theater, two combat support hospitals were moved. The first, the 28th Combat Support Hospital arrived south of Baghdad on 17 April 2003. The 21st CSH arrived in Balad a few days later.

Eventually, both of these hospitals were required to provide split based operations which resulted in degraded command and control, communication, maintenance, laundry, nutrition, medical and surgical capabilities in both of the hospitals. After the end of the major maneuver combat phase when the insurgency began to inflict serious casualties, the hospitals were hard pressed to deliver adequate care. Also, they were required to care for large numbers of Iraqi enemy prisoners and civilians. No level IV hospital, field or

general, was ever sent to Iraq. The 28th CSH at Baghdad was augmented with additional personnel including a neurosurgical and eye team.³³

Conclusion

The Army Medical Department has a proud tradition of providing medical care that spans two centuries and includes service in domestic conflicts, world wars, and regional conflicts. The Army Medical Department's service also includes smaller scale contingencies and military operations other than war including occasional large humanitarian efforts. Each of these efforts has provided its own unique challenges, and an opportunity to learn what is required to provide medical support to combat operations.

In WWI, the Army was supported by thirty 1000-bed hospitals in France. Smaller, but still large hospitals also accompanied troops in WWII. During WWII, the need for smaller mobile hospitals was recognized, and the AMEDD eventually developed a level III capable hospital that was completely mobile and these MASH units served with distinction in the Korean War. However, during the Vietnam War, fixed base camps and the types of operations they supported allowed the construction of semi-permanent, large, and extremely capable hospitals. After Vietnam, the AMEDD developed level III and IV hospital that were capable of caring for 300 to 500 patients. These hospitals were semi-mobile at best and relied on corps transportation assets to accompany troops on the battlefield. These external transportation assets were available for Operation Desert Storm and Shield, but were not available to medical forces for Operation Iraqi Freedom.

Initial observations from Operation Iraqi Freedom suggest the AMEDD needs to field a small, mobile, modular level III hospital that can be rapidly deployed and set up on the battlefield. Using modular concepts and medical specialty teams, including ICU,

ward, and specialty medical teams, the level III hospital should be expandable to meet any contingency including the roles traditionally performed by the level IV field and general hospitals across the full spectrum of operations expected in the 21st century.

¹John E. Jessup and Louise B. Ketz, *Encyclopedia of the American Military*, vol. 3, *Studies of the History, Traditions, Policies, Institutions, and Roles of the Armed Forces in War and Peace* (New York: Charles Scribner's Sons Macmillan Publishing Company, 1994), 1579-1581.

²Ibid.

³Ibid., 1590-1591.

⁴Jenny Goellnitz, "General Orders Number 147" (eHistory, 2004) [article on-line]; available from http://www.ehistory.com/uscw/features/medicine/cwsurgeon/orders_147.cfm; internet; accessed 7 November 2004.

⁵George W. Adams, "Caring for the Men, the History of Civil War Medicine" (Civil War Home, 2004) [article on-line]; available from <http://www.civilwarhome.com/medicinehistory.htm>; Internet; accessed 7 November 2004.

⁶Ibid.

⁷John E. Jessup and Louise B. Ketz, *Encyclopedia of the American Military*, vol. 3, *Studies of the History, Traditions, Policies, Institutions, and Roles of the Armed Forces in War and Peace*, 1609.

⁸Charles Lynch, Joseph H. Ward, and Frank W. Weed, *The Medical Department of the United States Army in the World War*, vol. 8, *Field Operations* (Washington, DC: Government Printing Office, 1925), 158-163.

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¹⁰First United States Army, *Report of Operations 20 October 1943-1 August 1944* (Office of Medical History, Office of the Surgeon General, 2004) [report online]; available from <http://history.amedd.army.mil/booksdocs>; internet; accessed 14 November 2004.

¹¹Ibid.

¹²John T. Greenwood, “Portable Surgical Hospitals” (Office of Medical History, Office of the Surgeon General, 2004) [article online]; available from <http://history.amedd.army.mil/booksdocs>; internet; accessed 8 November 2004.

¹³Mary E. Condon-Rall and Albert E. Cowdrey, *United States Army in World War II, The Technical Services, The Medical Department: Medical Service in the War Against Japan*, (Washington, DC: U.S. Government Printing Office, 1998), 134.

¹⁴John T. Greenwood, “Portable Surgical Hospitals.

¹⁵Headquarters, 45th Mobile Army Surgical Hospital, *History of the 8067th Army Unit, Mobile Army Surgical Hospital, (19 July 1950-31 January 1953) and 45th Surgical Hospital, Mobile Army, I-9* (Office of Medical History, Office of the Surgeon General, 2004) [report online]; available from <http://history.amedd.army.mil/booksdocs>; internet; accessed 8 November 2004.

¹⁶Ibid., 3-6.

¹⁷Ibid., 7-8.

¹⁸Albert E. Cowdrey, *United States Army in the Korean War, The Medics' War*. (Washington: U.S. Government Printing Office, 1987), 100-101.

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²⁰Ibid., 151

²¹Headquarters, 45th Mobile Army Surgical Hospital.

²²John E. Jessup and Louise B. Ketz, *Encyclopedia of the American Military*, vol. 3, *Studies of the History, Traditions, Policies, Institutions, and Roles of the Armed Forces in War and*, 1623

²³Spurgeon Neel, *Medical Support of the U.S. Army in Vietnam, 1965-1970* (Washington: U.S. Government Printing Office, 1973), 60-63

²⁴Ibid., 173.

²⁵Ibid., 65

²⁶Ibid., 67-68.

²⁷Robert M. Hardaway, *Care of the Wounded in Vietnam* (Manhattan, KS: Sunflower University Press, 1988), 1-14.

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²⁹ Frank F. Ledford, "From the Surgeon General of the Army, Medical Support for Operation Desert Storm" *The Journal of the US Army Medical Department*, 8-92 (Jan/Feb 1992): 3.

³⁰ Lois M. Davis, Susan D. Hosek, Michael G. Tate, and others, eds., *Army Medical Support for Peace Operations and Humanitarian Assistance* (Arlington, VA: RAND, 1996), [report online]; available from www.rand.org; internet; accessed 1 December 2004.

³¹ Headquarters Department of the Army, FM 4-02.10, *Theater Hospitalization* (Washington, DC: Headquarters Department of the Army, 2005), 2-1-2-28.

³² 212th Mobile Army Surgical Hospital, *212th Mobile Army Surgical Hospital, Operation Iraqi Freedom (21 March-17 April 2003), Lessons Learned*, 1-2 (Army Medical Department Lessons Learned, 2004), [report on-line]; available from <https://secure-ll.amedd.army.mil/Reports/>; Internet; accessed 14 November 2004.

³³ 28th Combat Support Hospital, *28th Combat Support Hospital, China Dragons! Operation Iraqi Freedom 10 March 2003-14 February 2004*, 8 (Army Medical Department Lessons Learned, 2004) [report online]; available from <http://secure-ll.amedd.army.mil/Reports/>; Internet; accessed 14 February 2004.

CHAPTER 5

ANALYSIS

Introduction

A qualitative case study method is used to answer the primary research question, which is how should the Army Medical Department provide level III and level IV combat health support in the future to operations using the brigade combat team, UEx, and UEy organizations. This study will also address the secondary questions of how mobile the hospital should be, what is the minimum (core) capability, and how can the hospital be expanded to meet level IV combat health support when necessary are also directly addressed. The case study method involves in-depth probing of a single phenomenon or situation. In this case that phenomenon is level III combat health support as it occurred in several recent operations. Cross case comparisons of various hospitals in several operations are performed using documents, archival records, and interviews of participants.

The purpose of this case study approach is to review the nature of selected medical operations over the past decade to determine the capabilities and shortfalls of the current level III hospital. The case study analysis of available literature is conducted chronologically by operation starting with Operation Provide Promise, and includes Operations Restore Hope, Operation Allied Force, Operation Enduring Freedom, and finishes with Operation Iraqi Freedom. Interviews conducted with personnel involved in Operation Iraqi Freedom will be summarized, and included with the evaluation of their units. Finally, the observations of the author are also included.

Operation Provide Promise

Operation Provide Promise was the American contribution to United Nations Protection Force (UNPROFOR) in the Balkans starting in 1993. This peacekeeping operation was a military operation other than war where heavy casualties were not expected. The AMEDD was not required to provide a full combat support hospital to provide level III care, and therefore, tasked the 212th MASH with the mission. The 212th MASH is a small level III hospital that is 100 percent mobile and capable of providing resuscitative and definitive (stabilization) surgery. The 212th MASH has 36 beds capable of providing intensive and ward care. The MASH is staffed by approximately 160 soldiers including doctors, nurses, medical service corps, and enlisted personnel.¹

This mission was limited to care of coalition forces including soldiers from a diverse group of nations with varying degrees of healthcare capability. Because of this, the 212th MASH was augmented as needed with appropriate care providers such as dental and preventive medicine physicians, but its staff essentially remained intact under the same command during its 6 month rotation.²

The 212th MASH evaluated 3,666 patients and admitted 333 patients.³ The 212th MASH was replaced by the 502nd MASH that also provided level III care. The MASH proved to be a capable unit for a small military operation other than war. It deployed as a trained and organized unit with an appropriate military and clinical staff that allowed it to arrive as a cohesive unit. When necessary, the hospital could be augmented easily, and the commander had the flexibility to adjust his staff as needed. For this operation, maneuvering on a battlefield was not required, but the MASH retained the capability of doing so.

Operation Restore Hope

Operation Restore Hope began in Somalia in December 1992. This operation was also planned, and for the most part remained a small-scale military operation other than war. Three rotations occurred in Somalia supported by three different level III hospitals that included a field, evacuation, and combat support hospital.

Each of these hospitals deployed with a fraction of its staff and hospital beds. For example, the evacuation hospital deployed with 104 beds, and the field hospital 32 beds. These hospitals usually field from 296 to over 400 beds. The AMEDD was able to augment the hospital where needed and scale back as required. The hospital was not required to move after it arrived. During this operation, the Army had the luxury of scaling back large hospitals to support a small-scale contingency operation because it was not supporting a major combat operation elsewhere simultaneously. However, using a portion of a combat support hospital in this way removed the non-deployed portions of staff, equipment, and the PROFIS assigned as assets available to be deployed, unless they were required in the same theater by the deployed portion of their hospital. Supporting multiple small-scale operations and/or a theater war in this way was successful, but inefficient.⁴

Operation Allied Force

The next small-scale military operation other than war for the army was in Albania starting in December 1999. Once again when the AMEDD needed a small level III capability, they turned to the 212th MASH.

The commander and personnel of the 212th MASH had recognized the possibility of supporting a brigade size contingency operation and wrote the following in an article discussing the preparation involved:

Several inherent problems can arise in creating a “new” organization for each contingency operation. Continually reorganizing doctrinally, institutionally developed medical units can also incur considerable expense. While in a deliberate planning process some of these problems are mitigated. These problems are magnified in the crisis planning process. These problems include:

- Desired equipment may or may not be part of the organization or the inventory.
- Personnel may be inadequately trained on this equipment.
- Repair parts and supplies may be unavailable.
- Inadequate time to integrate new personnel and learn appropriate standard operating procedures (SOP).
- Planning and preparing an organization for airlift is time consuming and demanding.
- Changes in equipment, supplies and personnel will affect the ability of a unit to deploy.⁵

The MASH developed a 14-Bed hospital with surgical and intensive care capability which could be rapidly deployed on 7-pallets. The addition of five 5-ton trucks made the package 100 percent mobile. This planning process allowed level III capability to be rapidly deployed. The remainder of the hospital could be deployed later to bring the MASH to its full capability.⁶

The 212th MASH personnel recognized the advantages of a rapidly deployable level III capability that could, if necessary, be augmented to its full capability. Importantly, the MASH trained this capability before implementation which contributed to its successful operation.⁷ It also validates the idea that some contingencies are so small that even small hospitals may be divided to support them. However, as Operation Enduring Freedom and Operation Iraqi Freedom would show, Army hospitals must be primarily designed to support major combat operations and the injuries they generate.

Operation Enduring Freedom

Operation Enduring Freedom provided unique challenges for the Army Medical Department. Tactically, the operation required forces to operate in forward operating bases separated by large distances. Forward surgical teams (FST) were used to bridge these distances. These 20-personnel teams, generally included three general surgeons and an orthopedic surgeon, and did well in the usual combat environment found in Afghanistan. However, the forward surgical teams were enhanced to provide more than level II care, but less than level III care. This is reported in the Operation Enduring Freedom (OEF) after action reviews:

- FSTs initial entry mission was asked to perform more than their basic mission of forward surgery without the assets to accomplish it.
- FST plus reconfigured to be a small hospital with a lighter footprint and can get there in time. A new TOE will have to be built.
- Issue of mobile, lightweight, modular, and support the new mission. 10/20-bed of this FST plus hospital.⁸

Another part of this AAR addressing the non-doctrinal use of forward surgical teams recommended they be augmented with “X-ray, Lab, Patient Holding (ICU/ICW), CMS, PAD, Med Log, Med Maintenance, Area Support, (sick call), and Dental. [They need to] have expansion modules to increase capability: i.e., number of beds, OR tables etc., as needed.”⁹ The above capabilities combined with a FST would constitute level III. The personnel who operated the level II forward surgical teams in Afghanistan are basically stating they needed a level III capability to provide the care desired.

The Afghanistan experience shows the AMEDD needs to develop a smaller level III hospital that is rapidly deployable. None of the after action reviews studied reported mobility problems. This is likely due to 100 percent mobility of the forward surgical

teams, the relatively fixed nature of the forward operating base, and the maneuver limiting terrain of Afghanistan.

Forward surgical teams in Operation Enduring Freedom were able to perform sick call, enemy prisoner of war care, and care of local populations due to the low number of casualties. They also provided excellent trauma care due to augmentation. However, the intensity of combat operations in Iraq would generate far more serious casualties, and the limitations of the forward surgical teams would result in the need for the more capable level III hospitals. The need for the proper employment of level III hospitals would become clear.¹⁰

Operation Iraqi Freedom

Six level III hospitals were tasked to support Operation Iraqi Freedom in 2003. Five of these hospitals were combat support hospitals. Of these, the 21st CSH was the only medical re-engineering initiative (MRI) hospital available. This meant it was doctrinally capable of split based operation for short periods. The 21st, 28th, and 86th combat support hospitals eventually were deployed in Iraq while the 47th CSH established a 296-bed hospital in Kuwait that was operational during and after phase III operations. The other level III facility was the 212th Mobile Army Surgical Hospital (MASH). The 212th MASH was arguably the only level III hospital to effectively provide care within the borders of Iraq during phase III (offensive) operations.

The Commander of the 212th MASH, LTC Kenneth G. Canestrini, wrote the following in the 212th AAR:

212th MASH had the honor and the privilege to be the first Army hospital into Iraq and the only hospital in Victory Corp's area of operations during the first 19 days of combat operations. The 212th MASH was the level III supporting the war

fight during the most intense period of combat operations. The MASH's excellent performance was due to being a highly trained, equipped and deployable unit.¹¹

Most after action reviews from Operation Iraqi Freedom have similar statements of praise from the unit commanders. The after action review for the 212th MASH is remarkable for a lack of serious internal problems encountered during the operation. This suggests the unit was well designed and trained for its mission. The following excerpt is from the summary of the 212th AAR:

The 212th MASH is a 36 ICU bed hospital designed to move itself far forward on the battlefield and provide resuscitative surgery, stabilization and evacuation. The 160 soldiers (9 MC, 29 AN, 6 MS, and 90 soldiers) with their 32 5-Tons, 5 HMMWVs, 3 ISOs and 12 MILVANs did exactly that during Operation Iraqi Freedom.

The 212th MASH (Miesau, Germany) received its deployment order for Kuwait on 14 January 2003. The initial order was delayed and as a result, the MASH was required to upload and get to the barge site within 72 hours. The leadership and direction of the NCOs, the previous deployment training, and working extremely long hours resulted in the unit's equipment meeting the short-fuse requirement. . . . The 212th MASH crossed the LD behind the 3d Infantry Division on 21 Mar 03. The Advon/HUSF arrived 12 hours ahead of the main body and established the HUSF (1 OR, 2 ATLS and 6 ICU beds, staked the hospital and emplaced initial security/NBC alarms. After a 78 hour convoy and 270 miles into Iraq, the 212th MASH arrived vicinity An Najaf 1800 24 Mar. For the first 5 days we were alone, several kilometers from the nearest unit, providing our own security as the MSRs became unsecure due to enemy action. The other units such as signal, maintenance, patriot batteries, CSB, RAOC, etc were not able to move up from Kuwait until the MSRs were secured. The hospital was established in Iraq's worst dust storm in over 30 years. The storm lasted 48 hours.

Within hours of becoming operational, our first combat casualties arrived. For the next 15 days, the 212th MASH was the only hospital directly supporting Victory Corps and its two divisions, the 3rd Infantry Division and the 101st Airborne (Air Assault) Division, engaged in combat operations. Workload during our establishment: 734 patients seen in EMT, 406 admissions, 377 evacuations, 260 RTD, 630 X-rays, 380 labs, 34 units of blood transfused, 1360 medications dispensed, 100 OR cases, 167 procedures, and 104 utilized loads. In one 24 hour period, we evacuated 65 casualties and twice the hospital flexed to 56 beds as weather, MEDEVAC availability, or availability of beds in theater prevented evacuation.

Two days after the Saddam statue fell in Baghdad, the 28th CSH (-) established a 44 bed hospital north of the 212th MASH and south of Baghdad.¹²

The 212th MASH was designed to be 100 percent mobile, and to provide resuscitative surgery far forward on the battlefield. It trained to perform this mission and encountered few obstacles in completing its mission. Some examples of problems encountered included difficulty coordinating logistics, delay in receiving bulk water, communication difficulties, need for an additional orthopedic surgeon, occasional difficulty coordinating MEDEVAC, and unexpected numbers of civilian and enemy casualties which were difficult to transfer.¹³ LTC (P) Kenneth G. Canestrini in an interview conducted by the author emphasized the importance of training, and the ability to move as key to the 212th Mobile Army Surgical Hospital's success:

I guess, my feel is two years of command, eighteen months of preparation, mental focus on equipment readiness, primarily fleet movement, and then focused on medical equipment. I think we had over 500 pieces of medical equipment, and just to keep all that stuff up you know, is a major chore. So anyway, I guess I wanted to harp that a lot of people say well, you were very successful because we were in the execution mode, but it was 18 months of preparation, of real world training, real world surgery, you know and all that stuff, and maintenance that prepped all that. Had we not done that, we would have been flat on our face like everybody else. So, anyway, the other thing was that when you are in that scenario, when they [combat units] are doing their stuff, they were very happy that the 212th had the ability to go from point a to point b without assistance, because getting flat beds forward to help with movement was a problem. If you're not ammunition and fuel, it's a problem, and my feeling was guess what, if you want to be a player on the battlefield with the army, you've got to be able to move.¹⁴

LTC (P) Canestrini is an advocate of the Army maintaining at least two mobile army surgical hospitals. He believes the small size of the hospital makes it rapidly deployable and facilitates the training required to support combat operation. Because of

the small size of the MASH, PROFIS integration is not required. All personnel assigned to the hospital know their roles and strengths, and this make the unit similar to a Special Forces unit, according to LTC (P) Canestrini, “they’re highly skilled, highly trained, and highly motivated. I kind of used that mentality with the MASH guys. You’re small, you’re elite, [and] you’re special.”¹⁵ In his opinion, the larger combat support hospitals are better suited for the operations that follow the combat phase.

The 212th MASH performed its doctrinal mission well in Iraq, and shortly after the ground phase of OIF I it was redeployed. The 212th Mobile Army Surgical Hospital’s most remarkable contribution was its ability to move and support an offensive operation over hundreds of miles, or more simply, to be there. The 212th MASH is not however, modular. It does not have the infrastructure to expand much beyond its designed capacity. The 734 patients evaluated and the 100 surgeries performed represents a fraction of the care provided by all level III hospitals in the battles that would follow, but for the first 17 days, it provided almost all level III care in Iraq.¹⁶ Figure 1 shows the assembled 212th MASH.



Figure 1. The 212th MASH Level III Medical Treatment Facility in Support of Offensive Operations During Operation Iraqi Freedom in March of 2003.

Picture Obtained from the 212th MASH AAR at AMEDD Lessons Learned Web Site.

The 86th CSH, a 296-bed hospital, established an 80-bed hospital at Camp Udari in Kuwait prior to offensive operations starting in Iraq.¹⁷ This hospital was not an MRI CSH and was not designed for split-based operations. This hospital also created a “slice element” which according to an after action review included:

40 hospital beds, 2 OR tables and approximately 120 personnel (including 5 surgeons and 3 anesthesia providers. . . . The slice element convoy entered Iraq on 22 MAR 03, and arrived at Tallil Air Base (Camp Adder) outside of An Nasaryah on 24 MAR 03. The slice element set up in an abandoned building on the edge of the runway and was operational immediately.¹⁸

The 86th CSH “Slice Element” has many of the characteristics of the MASH described earlier. The medical personnel recognized the need for a level III facility forward and created this non doctrinal unit. The remainder of the CSH joined the slice about a month later. The Split-based operations contributed to shortages in personnel, supplies and capabilities.¹⁹

The 47th CSH played an important role in Operation Iraqi Freedom. It was established in Kuwait, and was the only MF2K CSH doctrinally employed during OIF I. The hospital received over 4,000 casualties that were then evacuated to Level IV facilities out of theater. It also admitted over 400 patients, and was the initial site of many specialty care teams. The 47th CSH was not required to move into Iraq, and therefore, did not encounter the types of problems hospitals moving forward encountered. With 2000 inpatient admissions over several months, it generally used only a small percentage of its deployed hospital beds. Figure 2 demonstrates the size and complexity of the fully deployed 296-bed CSH, and is from the 47th Combat Support Hospital AAR.²⁰



Figure 2. The 47th Combat Support Hospital Configured as a 296-Bed Hospital in Kuwait during Operation Iraqi Freedom I in 2003

Picture obtained from the 47th CSH AAR found at the Army Medical Department Lessons Learned Website.

The 28th CSH was the first combat support hospital to be established near Baghdad. This hospital had not undergone MRI and was designed to be a single 296-bed level III hospital, but this is not how the hospital was utilized. The following excerpt is from the 28th Combat Support Hospital's after-action review:

On 28 March 2003, only 18 days after the first soldier arrived in theater, the 28th Combat Support Hospital received an order to move a 44-bed hospital forward to Forward Operating Base (FOB) Rams/Logistics Support Area (LSA) Bushmaster and then to continue onward movement to Forward Logistics Base (FLB) Elm in support of the 3rd Infantry Division's (MECH) push toward Baghdad. . . . Two days after the Saddam Statue fell in Baghdad, the 28th CSH (-) established a 44 bed hospital at LSA Dogwood.

On 11 May, the Hospital received an order to move a 32-bed hospital north to Tikrit, Iraq in support of the 4th Infantry Division's (MECH) operations in and around the historic city renowned [SIC] as Saddam Hussein's birthplace.²¹

The 28th CSH commander and personnel anticipated the need for a smaller more mobile hospital, and using internal assets they were able to create what they called a "Rapid Mobile Surgical" hospital that could move itself while the remainder of the hospital waited. This unit consisted of 47 vehicles and 219 soldiers, and provided a level III capability near Baghdad.²²

The deployment of the non-doctrinal Rapid Mobile Hospital created several unanticipated problems for the unit:

The constant change in our mission from a 32-bed package, to 44-bed package, then a 24-bed package was very detrimental to the morale of CSH members. Also, those members left in the rear versus those going forward created morale problems within the unit. Individuals in the rear expressed frustration and disappointment since they felt they were deployed without a mission for them.²³

Due to the constant changes in mission and the need for self deployment MILVANS were packed re-packed, and packed again.²⁴

It is not surprising that a unit trained and organized to function as a 296-bed hospital develops confusion and morale problems when, in the process of deploying, the unit organization and mission are changed. The AMEDD failed to provide adequate numbers of mobile hospitals prior to the war; so units like the 28th CSH were forced to develop mobility during the war. The after action review concludes the hospital must be 100 percent mobile:

Medical units need to be prepared to move 100% of their equipment on the battlefield organically. . . . If the 28th CSH had not been able to scrounge more vehicles and develop a 44-bed package, no hospital would have been available to relieve the 212th MASH for 2 months. At the pace casualties were arriving and their limited staff, it is unlikely they could have hung on without respite.

Recommendation: Medical units must have sufficient organic vehicles to carry all

required equipment for a 44-bed hospital, the CTA items associated with life support, personnel and all their gear, plus additional class IX.²⁵

The 296-bed combat support hospital was not designed doctrinally to perform split based operations, but instead of bringing the rest of the hospital to Logistic Support Area (LSA) Dogwood and completing the reassembly of the hospital, the 28th CSH was ordered to establish a second level III 32-bed hospital using organic assets in Tikrit.²⁶

The following statement is from the 28th CSH AAR and it describes some of the problems split-based operations created:

Splitting left each unit without enough spares for equipment. Since personnel manning is inadequate to support peacetime requirements for intensive care patients in the MF2K MTOE, personnel shortages were exacerbated by split basing. All soldiers were on duty longer with less rest. The orthopedic surgeons went from call every 3rd night call to every other night call at one site and constant call at Tikrit. Emergency Medicine physicians worked 12 hour shifts at one site and a 12 hour shift, but on 24 hour call at the other location. Equipment was correspondingly overworked.²⁷

The 28th CSH was not able to establish a second level III facility using organic assets. However, after being augmented with personnel and equipment from other units a 44-bed level III hospital was maintained at LSA Dogwood and a 32-bed hospital at Tikrit. There were many problems, including insufficient staff officers, which contributed to the difficulty of providing medical logistics at both locations, difficulty coordinating command and control, and difficulty providing adequate water, power, and living conditions. The hospital was inappropriately staffed for the large number of wounded enemy prisoners and pediatric patients, and there were insufficient clinical staff for two locations. Creating a second ad-hoc hospital in a combat zone is not a formula for success, but the command, staff, and personnel made both hospitals successful.

The executive officer of the 28th CSH in Iraq was then Major and now LTC Lee Schiller. In an interview conducted for this thesis, he made the following observations.

The 28th CSH fell in on pre-positioned equipment in Kuwait, and with only thirteen 5-ton trucks could only move a 44-bed hospital especially with the added chemical protective equipment needed to protect the hospital. While the 47th CSH and the 21st CSH were used doctrinally, the 28th CSH was not used doctrinally. Many of the hospitals difficulties resulted from its non-doctrinal deployment. LTC Schiller points out the CSH did not plan for split based operations. This created difficulties with generators and other equipment. Also, the 28th CSH at one point was caring for more burn patient than the burn unit at Brooke Army Medical Center. The 28th had the responsibility for caring for enemy prisoners that could not be transferred to the local community or moved out of the theater, and that level III is not meant for long term care. LTC Schiller praised the efforts of the personnel involved with the 28th CSH.²⁸ He also provided the author with a presentation titled “MRI CSH Review TF MED Version 1.1 for Commanding General AMEDD Center and School.” This presentation was the result of a review of the current combat support hospital’s capabilities and organization conducted by many medical veterans from OIF and OEF including LTC Schiller.²⁹

The group describes the following desirable traits for a combat hospital. It should be “rapidly deployable, modular, flexible, scaleable, transportable, tailorable, and augmentable.”³⁰ The group covered a very broad spectrum of issues associated with level III hospitalization. The following recommendations are a few pertinent to this thesis. “[The] initial entry hospital should be a stand alone SRC capable of extended operations, decrease AMI MRI CSH overall hospital capacity based on new CAC scenario casualty

estimates, include care of civilians, EPWs in TOE documentation, and ensure stand-alone, 100% transportation capability for revised initial entry hospital.”³¹

The group recommended three possible hospitals based on mobility and hospital beds among other criteria. Option A was a 32-38-bed hospital that is 100 percent mobile. Option B was a 96-110-bed hospital that was 70 percent mobile, and option C was a combination of A and B with a 100 percent mobile A section and a 25 percent mobile B section.³²

The 28th CSH at LSA Dogwood and later in The Green Zone eventually operated with approximately 80-hospital beds. It was augmented with a neurosurgical team, an ophthalmology team, a microbiology team and a forward surgical team. The presence of many individual augmenting personnel allowed the hospital to essentially become the level IV hospital for the theater because of their subspecialty capabilities. The main hospital at LSA Dogwood and later *Ibn Sina* in the Green Zone evaluated 13,877 patients, admitted 3435 patients, and performed 2,300 surgeries.³³ It did so with a hospital much smaller than doctrinally required after augmentation with subspecialty teams, individuals and equipment.

The 28th CSH developed a 44-bed hospital that was 100% mobile and capable of delivering level III care. The hospital was then expanded to 80 beds and augmented with personnel to staff those beds. The hospital also was expanded in capability by adding subspecialty detachments resulting in a level IV referral center. This hospital is a possible model for future level III care on the battlefield because it is mobile and has the infrastructure to support modular expansion. The modules themselves are represented by units like the 207th Neurosurgical Team that were deployed as detachments.

The 21st CSH was the final level III hospital established in Iraq. This hospital was the only MRI CSH in the theater. It had trained split-based operations prior to the war, and according to medical doctrine should be capable of split-based medical operations.³⁴ When the 21st CSH was split with the larger segment at LSA Anaconda at Balad and the second segment in Mosul, it was not able to support split-based operations using organic assets and was also required augmentation with personnel from other units. The augmentation of the 21st and 28th Combat Support Hospitals using personnel from the 10th CSH left the 10th CSH non-operational and it was re-deployed without being used as a combat support hospital. The non-doctrinal augmentation in theater also made planning the next rotation of hospital and medical personnel difficult for the Army Medical Department. The 21st CSH encountered many of the same problems the 28th CSH encountered. Ultimately there were four small level III hospitals established in Iraq. Given time, the AMEDD improved the facilities and infrastructure at these facilities. Operations stabilized and this allowed relatively fixed hospitals to improve their capabilities.

External after action reviews also noted the problems of the combat support hospitals. The Office of the Surgeon General AAR Team in May 03 noted simply, “CSH doctrine should be changed to reflect the required mobility and modularity sought during OIF.”³⁵ They were also critical of the effects of split-based operations and its effect on staffing, especially of orthopedic staffing, and this was at a time when casualties were relatively light.³⁶

COL David Cohen in his after action review on the role of the combat support hospital stated the following:

The 21st CSH, while I was deployed with it, was divided into two slices, the larger slice at LSA Anaconda in Balad and the smaller slice in Mosul. The Commander remained in the main slice in Balad and the DCCS became the “commander” of the slice in Mosul. Each slice was capable of caring for about 40 patients. . . . Both major CSH’s hospitals in theater are split. It works so well that one should consider making the generic CSH half the current size. . . . These are not mobile hospitals by any stretch of the imagination. If a larger hospital is needed, the small units could be brought together as a medical task force. . . . Divided CSHs are separate units “in fact.” Smaller independent hospitals would make command and control easier than a divided CSH with a slice at distant locations.³⁷

Colonel Cohen succinctly concludes small hospitals with intact command and control and increased mobility function well, and further, if a larger hospital is required, it could be built by adding small units.

Author’s Retrospective Observations

The author of this paper was deployed to OIF I as a general surgeon first with the 10th CSH, and later with the 28th CSH. The 10th Combat Support Hospital’s original mission involved supporting the 4th Infantry Division through Turkey as part of Task Force Iron Horse. When this operation was cancelled, the 10th CSH was sent to Kuwait and reassigned to the 62nd Medical Brigade. In April in Kuwait, the 10th CSH attempted to create a small hospital that could move itself in order to support the ongoing combat operation. After days of work that involved unpacking and repacking MILVANS, a small 20-bed hospital was ready to move into Iraq. However, this mission was also cancelled. The 10th Combat Support Hospital’s transportation assets were then used to assist the moves of the 28th and 21st Combat Support Hospitals. This was, of course, very disappointing to the personnel of the 10th CSH who had trained together for months in preparation for combat.

The decision was eventually made not to employ the 10th CSH as a combat hospital. Instead, its largely surgical staff was assigned the role of performing redeployment exams, until the struggling hospital split based operations in Iraq required the transfer of many of these trained surgeons, physicians, nurses, medics and other specialists to the badly understaffed split 21st and 28th Combat Support Hospitals.

The author arrived at the 28th CSH (Main) in June of 2003 with one other general surgeon from the 10th CSH. This brought the total number of general surgeons present at the hospital to four. An orthopedic surgeon from the 115th EVAC Hospital brought the total orthopedic surgeons to two. A few weeks later the hospital was further augmented by the 1st Forward Surgical Team that added a trauma surgeon, pediatric surgeon, orthopedic surgeon, and a cardiothoracic surgeon to the staff. The specialists surgeons assigned to the 1st FST were particularly helpful given the complexity of patients being cared for at the 28th CSH, but there was no plan to send them specifically. It was simply a fortunate coincidence they had been assigned to the 1st FST, and were therefore available when the 1st FST was subsequently attached to the 28th CSH.

The surgeons, emergency department physicians, medics, medical technicians, pharmacy staff, laboratory staff, administrative staff, command staff, and other personnel were all very capable, and worked extremely hard to overcome problems daily. The major problems encountered were primarily due to difficulties obtaining class VIII medical supplies, difficulties obtaining other classes of supply, and a significantly degraded infrastructure of the hospital due to the requirement to support two hospital locations.

The most frustrating aspect of providing care to patients at the 28th CSH was the inability of the hospital to provide for the complexity of care required by the patients. The 296-bed hospital was designed for resuscitation and stabilization surgery, and it performed this mission well in regards to US and coalition forces that were usually transferred to Landstuhl Regional Medical Center fairly soon after their required care. However, the hospital also was given an unanticipated mission of caring for wounded Iraqi civilians, friendly Iraqi forces and enemy prisoners. Many of these patients were grievously injured burn patients, wounded children, and patients with complex wounds beyond the normal capabilities of the CSH. The medical personnel were simply encouraged to do their best, but even this was difficult given the medical supply problems, the lack of a laboratory capable of performing cultures, and equipment which was only meant to be transiently used, like small portable ventilators.

It is the author's opinion that many of these problems could have been overcome if the AMEDD had retained the ability to deploy a deliberately planned level IV facility with the appropriate personnel and equipment to care for these types of patients. This would have improved our ability to care for the Iraqi patients and could have contributed to positive information operations.

The situation was improved as quickly as possible. The hospital's capabilities were expanded early on by a neurosurgical team that included two neurosurgeons, a neurologist, and a nurse anesthetist, and a CT scanner. Additionally, an eye team with two ophthalmologists was attached due to the frequency of eye injuries. The hospital was also reinforced with a pulmonary critical care physician and the laboratory capability to perform cultures after a mysterious outbreak of pneumonia in the theater that was

publicized in the national media. These additions and others eventually resulted in a theater hospital that approximated a level IV capability.

The 28th Combat Support Hospital's situation improved significantly when it moved to *Ibn Sina* Hospital in the "Green Zone" in August. A detachment from the 28th CSH under the direction of the executive officer worked for several weeks with the assistance of the 30th Medical Brigade Staff to prepare the hospital for service. Moving to a fixed facility alleviated much of the hardship the hospital staff had endured. The food was contract provided, showers and portable toilets were available, the hospital was air conditioned, and staff quarters in the living areas were substantially improved to include air conditioning.

The medical logistical system was improving, but the CSH was supplementing its medical supplies by having medical attendants, who accompanied patients to Landstuhl Regional Medical Center in Germany, bring back critically short supplies. The equipment, especially the ventilators, was still inappropriate for long term care of critically wounded patients. This was the situation when the author was redeployed in October of 2003. It is worth mentioning that despite the difficulties, the AMEDD personnel assigned, based on survival data, provided the best combat care in their history for U.S. Forces.³⁸ The author's opinion is this was largely due to the investment the AMEDD made in training all types of AMEDD personnel prior to the war, which gave them the capability to overcome, in large part, the difficulties encountered during OIF I. Figure 3 is a photograph of the 28th CSH taken by the author from a UH 60 MEDEVAC helicopter in May of 2003.

Conclusion

The Army Medical Department has rarely utilized a combat support hospital in its 296-bed or a 248-bed configuration since Operation Desert Shield and Storm. Small scale operations that followed Operations Desert Shield and Storm were supported with partially deployed evacuation, field, and combat support hospitals and fully and partially deployed mobile army surgical hospitals. Operation Iraqi Freedom began with large hospitals attempting to produce smaller detachments that could move with the units they were intended to support. OIF subsequently produced the most combat casualties since the Vietnam War. To support these casualties, the AMEDD split their larger hospitals into smaller sections and located these hospitals in multiple locations. The split portion of the 28th CSH at Logistical Support Area Dogwood and later, *Ibn Sina* in the “Green Zone” was augmented to provide specialty care, and became the level IV theater hospital by default. No hospital at any location required more than eighty beds on a regular basis.

The results of the Army Medical Department’s experiences since Operation Desert Shield and Storm seem to indicate the Army requires a smaller, more mobile operational hospital to support its brigade combat teams, UEx, and UEy organizations. Chapter 6 will discuss the results of this analysis in more detail, and make recommendations for a possible future medical unit of action.



Figure 3. The 28th Combat Support Hospital (Main) as Configured at Logistical Support Area Dogwood in May 2003

¹212th Mobile Army Surgical Hospital, *212th Mobile Army Surgical Hospital, Operation Iraqi Freedom (21 March-17 April 2003) Lessons Learned* (Army Medical Department Lessons Learned, 2004) [report on-line]; available from <https://secure-ll.amedd.army.mil/Reports/OIF>; Internet; accessed 14 November 2004.

²Lois M. Davis, Susan D. Hosek, Michael G. Tate, and others, eds., *Army Medical Support for Peace Operations and Humanitarian Assistance* (Arlington, VA: Rand, 1996), Chapter 3 [report on-line]; available from www.rand.org; Internet; accessed 12 November 2004.

³Ibid.

⁴Paula C. Lodi, “The Army Medical Department and Full Spectrum Operations” (Monogram, School of Advanced Military Studies, United States Command and General Staff College, Fort Leavenworth, KS, Feb, 2002), 23-25.

⁵Alan L. Moloff and Susan Denny, “The Contingency Medical Force. Chronic Challenge, New Solution”, (Army Medical Department Lessons Learned, 2004) [article on-line]; available from <https://secure-11.amedd.army.mil/Reports/CMF>; Internet; accessed 13 November 2004.

⁶ Ibid., 3-4.

⁷ Ibid., 2-4.

⁸Office of the Surgeon General, *General Officer Out-brief Report, Operation Enduring Freedom Medical AAR 25 October 2002* (Army Medical Department Lessons Learned, 2004) [report on-line]; available from <https://secure-ll.amedd.army.mil/Reports/>; Internet accessed 12 November 2004.

⁹Ibid., 2.

¹⁰John Holcomb, FRAGO# XXX, “Optimal Use of Level II and III Assets in OIF, 4 June 2004” (Army Medical Department Lessons Learned, 2004) [article on-line]; available from <http://secure-ll.amedd.army.mil/Reports/OIF>; Internet; accessed 5 November 2004.

¹¹212th Mobile Army Surgical Hospital.

¹²Ibid.

¹³Ibid.

¹⁴Colonel Kenneth G. Canestrini (Former Commander of the 212th Mobile Army Surgical Hospital), telephone interview by author, 1 March 2005, Fort Leavenworth, tape recording, Command and General Staff College, Fort Leavenworth.

¹⁵Ibid.

¹⁶212th Mobile Army Surgical Hospital.

¹⁷Mark A. Meeks, “After Action Review of MAJ Mark A. Meeks, 86th Combat Support Hospital, Operation Iraqi Freedom” 29 September 2003 [article on-line]; available from <https://secure-ll.amedd.army.mil/Reports/OIF>; Internet; accessed 12 November 2004.

¹⁸Ibid., 1-7.

¹⁹Ibid., 6-7.

²⁰47th Combat Support Hospital, *47th Combat Support Hospital: Camp Wolf, Kuwait, Operation Iraqi Freedom Annual Historic Report, (MAR-DEC 03)*, 7 (Army Medical Department Lessons Learned, 2004) [report online]; available from <http://secure-ll.amedd.army.mil/Reports/>; Internet; accessed 6 November 2004.

²¹28th Combat Support Hospital, *28th Combat Support Hospital, China Dragons! Operation Iraqi Freedom 10 March 2003-14 February 2004*, 7 (Army Medical Department Lessons Learned, 2004) [report online]; available from <http://secure-ll.amedd.army.mil/Reports/>; Internet; accessed 6 November 2004.

²²Ibid., 6-7.

²³Ibid., 19.

²⁴Ibid., 20.

²⁵Ibid., 25.

²⁶Ibid., 7.

²⁷Ibid., 64.

²⁸Lee Schiller (Former Executive Officer of the 28th Combat Support Hospital), interview by author, 24 February 2005, Fort Leavenworth, notes, Command and General Staff College, Fort Leavenworth.

²⁹AMI MRI CSH Review Team, “MRI CSH Review TF MED Version 1.1 for Commanding General AMEDD Center and School” (presentation given to the commanding general of the AMEDD Center and School at San Antonio, TX: 1 September 2004.

³⁰Ibid.

³¹Ibid.

³²Ibid.

³³28th Combat Support Hospital, 70.

³⁴Headquarters, Department of the Army, FM 4-02.10, *Theater Hospitalization* (Washington, DC: Headquarters Department of the Army, 2005), 2-3.

³⁵Office of the Surgeon General, *Office of the Surgeon General Surgical AAR Team*, 3 (Army Medical Department Lessons Learned, 2004), [report online]; available from <http://secure-ll.amedd.Army.mil/Reports/>; Internet; accessed 8 November 2004.

³⁶Ibid, 9-10.

³⁷David J. Cohen, “After Action Report on Deployment to Iraq: Role of the Combat Support Hospital” (Army Medical Department Lessons Learned, 2004) [article online]; available from <http://secure-ll.amedd.army.mil/Reports/OIF/>; Internet; accessed 8 November 2004.

³⁸Eric Kramer, “Technology Boosting Survival Rate in Iraq” (Army News Service, 2005), [article online]; available from http://www4.army.mil/ocpa/read.php?story_id_key=5337; Internet; accessed 27 April 2005.

CHAPTER 6

RESULTS AND RECOMMENDATIONS

Introduction

This chapter answers the primary research question: how should the AMEDD provide level III and IV care to the brigade combat team (BCT), UEx (future division/corps), and UEy (future corps/army). This will be accomplished by first presenting the desired capabilities based on the previous chapter's analysis compared to current hospital capabilities followed by a recommended medical unit of action that will meet the strategic and operational requirements for level III and level IV hospital support of the BCT, UEx, and UEy. This process answers the secondary questions:

1. What is an effective functional core module for a level III facility?
2. How can the hospital be expanded using modular concepts?
3. What is the mobility requirement?
4. What is the role for a level IV facility?

Required Capabilities

The data collected in the previous chapter suggests the U.S. Army needs to field a level III hospital that is capable of organic movement while retaining the capability to treat combat casualties. To support the tactical BCT and UEx, the base hospital must be 100 percent mobile in order to support maneuver operations that may include offensive operations and defensive operations. Based on recent operations, the level III hospital should be able to provide 36-80 beds capable of providing critical and intermediate care to combat casualties and non-battle injured soldiers. The hospital should also be able to

provide a variable level IV capability by possessing the capability to expand to support modular specialty medical detachments, and additional modular nursing detachments if needed in a theater based on changing mission requirements.

The Corps and Echelon Above Corps Hospital

The corps and echelon above corps hospitals are capable of providing comprehensive combat care including emergency medical treatment, general resuscitative and definitive surgery, and orthopedic surgery. The hospital is also able to provide intensive care and intermediate care and provides psychiatric care. The hospital includes a basic radiology, laboratory, and nutrition care capability. It has the support infrastructure to allow limited augmentation when deployed as a complete 248-bed hospital. Doctrinally, the corps combat support hospital is capable of performing split based operations.¹

The corps combat support hospital and the echelon above corps combat support hospital do have a certain kind of modularity based on its ability to perform split based operations. It has a 184-bed company and an 84-bed company. Both can operate as smaller hospitals. However, this type of modularity requires deconstruction of the intact unit into smaller elements. When the entire hospital is not required for a mission, this strategy makes whatever portion of the hospital that is not required unavailable for another mission. In effect, the unused portion of the hospital is placed in storage as it lacks the command structure and support elements required to deploy, and the personnel not deployed become caretakers. The PROFIS personnel technically become unavailable although in OIF many of them were re-assigned as individual augmentation personnel. This type of modularity is readily supportable in peacetime when hospitals are

infrequently deployed. However, in wartime, when multiple hospitals are required, it is very difficult to justify this inefficient strategy. The commonly used analogy to describe modularity is that of a hundred dollar bill.² Before modularity, the Army would have to break the hundred dollar bill to design the required capability. Modularity uses ten and twenty dollar bills to efficiently build the required capability. The current CSH still looks like a hundred dollar bill that usually must be broken to support the assigned mission.

The corps combat support hospital and EAC CSH lack adequate mobility. The EAC CSH is non-mobile while the Corps CSH has about the same mobility as the MF2K CSH. The 84-bed hospital can be divided into a 44-bed Early Entry Hospital Element that is 100 percent mobile. This does incorporate into doctrine what the majority of combat support hospital personnel did to make their hospitals capable of moving to support maneuver operations in OIF I, and it does overcome the lack of a mobile level III hospital that was so problematic in OIF I. However, the vast majority of the hospital remains non-mobile, and is a tactical liability when the full 248-bed hospital is deployed due to its partial mobility.

Based on an assessment of the medical operations considered in this thesis, the current combat support hospitals in all their configurations lack the mobility the U.S. Army requires to support combat operations. Also, based on recent operations, the combat support hospitals are inefficiently organized with 248 beds. The number of beds required in recent operations has generally been in the range of thirty-six to eighty. This suggests the level III hospital should be designed around this number of beds while emphasizing the requirement to care for combat injuries, but with the flexibility to expand to more comprehensive care where needed. The base hospital must be 100

percent mobile in order to support maneuver operations that may include offensive operations and defensive operations including a mobile defense or retrograde operation.

The MASH

The MASH is 100 percent mobile and the value of this capability was clearly demonstrated in Operation Iraqi Freedom I not to mention the Korean War when retrograde operations were common.³ The hospital also has the ability to provide comprehensive combat care including emergency medical treatment, general resuscitative and definitive surgery, and orthopedic surgery. The hospital is also able to provide intensive care and intermediate care, and has basic radiology, pharmacy and laboratory capability.⁴ Certainly, the MASH does not have the same capability to expand as the combat support hospitals. It would be hard pressed to support a single medical detachment based on its limited infrastructure. The MASH concept seems to have proven its value not only in major combat, but also in multiple small-scale operations.

Currently, the 212th MASH is scheduled to undergo medical re-engineering initiative conversion to a corps combat support hospital. The 212th MASH is the last MASH in the Army. Despite this, the future Army Medical Department Unit of Action level III Hospital should possess many of the characteristics of the MASH including its mobility and fundamental trauma ability as a base capability. The MASH has shown itself to be the right size for many of the recent operations supported by the Army Medical Department. The next generation of level III hospitals will need to overcome the infrastructure weakness of the current MASH in order to have the flexibility to expand to support medical detachments while retaining its mobility.

Ad Hoc Medical Task Forces

Level III hospitals are the place on the battlefield where medical personnel are able to definitively intervene medically to change what would otherwise be fatal injury outcomes. It also is staffed with specialized physicians able to care for common diseases and psychological stressors encountered in combat.⁵

In combat, level I is primarily designed to control bleeding and treat life threatening conditions like pneumothorax, and then to rapidly evacuate patients to level II and level III medical treatment facilities. Level II is able to provide basic medical care and is able to hold patients who can return to duty within 72 hours.⁶ Forward surgical teams are sometimes attached to forward support medical companies (FSMC) to provide a limited surgical capability. This combination of FST and FSMC has been used in lieu of level III in some operations and is even referred to a level II+ in medical doctrine.⁷ However, it does not represent a true level III capability. It has no ability to provide intensive care and only two surgery beds with a limited medical supply and pharmacy capability.⁸ Its surgeons are also generally inadequately trained to provide non-surgical medical specialty care, and it has a limited supply of blood and medical equipment. It also lacks the personnel to plan operations effectively, and lacks critical functions like patient administration and signal support among many others.

The level II plus combination was used with some success in Afghanistan, but the personnel who worked in these ad-hoc organizations were critical of their capabilities, and recommended a new TOE unit be created to provide the appropriate level of care.⁹ It seems clear that ad-hoc medical organizations provide care that is generally inferior to care provided at level III hospitals, and their use should be limited wherever possible.

UEx and UEy Requirements

The UEx is a division/corps size headquarter element capable of providing command and control for up to five brigade combat teams and a variable number of supporting brigades. The UEx is capable of functioning as a joint task force headquarters and the theater army forces headquarter. The UEx is a large organization with over 1000 soldiers assigned.¹⁰ The UEx is designed to support moving forces. It has a main command post, two tactical command posts and a mobile command group. The UEx replaces the division that is a tactical unit. It is a reasonable conclusion that medical units supporting the UEx organization should be capable of independent movement.

The UEy is a corps/army level headquarter element and is intended to be a large joint task force organization.¹¹ The UEy is still being developed, but it can be assumed it will be deployed when multiple UEx operations, involving coalition and joint forces, are undertaken.

A UEx and UEy have no permanently assigned brigades. They build the force structure they require based on the mission they are assigned. Part of the force structure they will require is medical support. Level I and level II combat health support will likely remain in the brigades with a forward support medical company equivalent, and battalion aid stations and medics. The level III hospital will most likely be assigned to the medical command structure developed for the UEx and UEy. It is clear that a deployed UEx and UEy will require level III hospital support. Therefore, given a truly modular level III hospital, the basis of allocation should be one active component level III hospital per UEX and UEy. Ideally, these level III hospitals would be assigned to the same post as the UEx or UEy and have established relationships with those units. Additional level III

hospitals should be maintained in the reserve component for the purpose of augmenting the active component hospitals if required.

In order to support each UEx or UEy with a single level III hospital, the hospital will have to be modular. It must have the flexibility to expand to provide specialized care based on the mission, enemy, patients, terrain and civil military concerns present. In order to support UEx operations it should be a tactical unit and therefore, it must have the mobility to move on the battlefield and support combat operations over the same distance the UEx or UEy organization covers.

Summary of Current Capabilities

The level III hospital is arguably the center of gravity for combat health support. In combat, it is the level of care that provides seriously wounded and ill patients with life saving surgery and treatment. It is also the place where patients are stabilized in order to be evacuated out of theater. The comprehensive review conducted of recent medical operations in this thesis demonstrate the AMEDD level III hospital must be able to support maneuver operations over large distances. The only level III hospital to do this effectively in OIF I was the 100 percent mobile MASH. Further, recent operations remind us the focus of level III hospitals is combat trauma surgery followed by non-combat trauma and then non-battle injuries.

The combat support hospitals have the surgical and medical capabilities required. They also have the command structure, staff, service and support and maintenance capabilities required to sustain long-term medical operations. However, the combat support hospitals lack the required mobility, and are too large to be efficiently utilized.

The MASH has the required mobility, but lacks the organic flexibility to expand to support modular medical detachments.

Therefore, the AMEDD needs to build a future level III Medical Unit of Action (MUA) that incorporates the mobility of the MASH with the capabilities of the CSH. Using modular concepts, the AMEDD should be able to expand any basic Medical Unit of Action to a level IV capability to include specialized surgical and medical care and hospital beds to support a longer theater evacuation policy when required.

The Recommended Mobile Modular Medical Unit of Action

Currently, the AMEDD plans to maintain seven combat support hospitals in the active force.¹² The AMEDD could almost immediately create several mobile, modular, medical units of action from these units through doctrinal, organizational, and training changes. The personnel and equipment currently found in the combat support hospitals not required for the medical units of actions could be reorganized into nursing and other medical detachments that would then become the building blocks for the MUA.

The organization of the medical unit of action should allow the command to easily control administration services, medical and surgical clinical services, nursing services, and hospital ministry. When determining the appropriate rank structure for the medical unit of action, consideration should be given to the potential deployment of the hospital as a level IV type facility with multiple subspecialty capability. Therefore, an experienced colonel should command the medical unit of action. Figure 4 shows an organization that is suggested as a practical concept of the basic medical unit of action command structure.

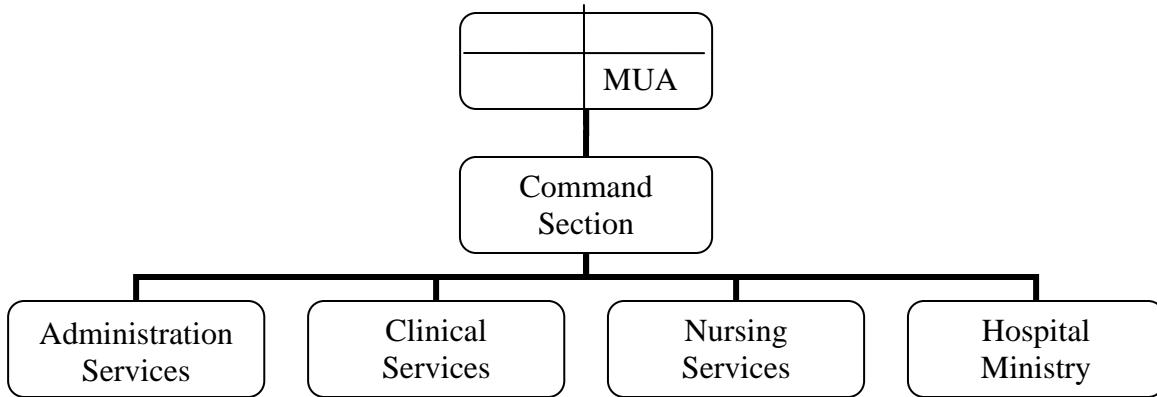


Figure 4. Suggested Command Structure of the Medical Unit of Action

The command section should retain the rank structure found in the combat support hospital. The medical unit of action retains the capability through modularity to expand to or exceed the bed and subspecialty capability of the combat support hospital. The command section should at least consist of the commander, deputy commander of clinical services, deputy commander of nursing services, executive officer, command sergeant major, chaplain, and an administrative specialist.

The administrative staff of the medical unit of action is coordinated by the executive officer and should have a standard staff structure. The S-4 service and supply section must have the capability to maintain vehicles, generators, environmental control units and provide basic medical maintenance. The hospital will be required to communicate with local ground units, army aviation units, air force evacuation units, and level IV and level V facilities outside and inside the continental United States, and

requires a sophisticated S-6 communications capability. Figure 5 is a possible organization for the administrative section of the hospital.

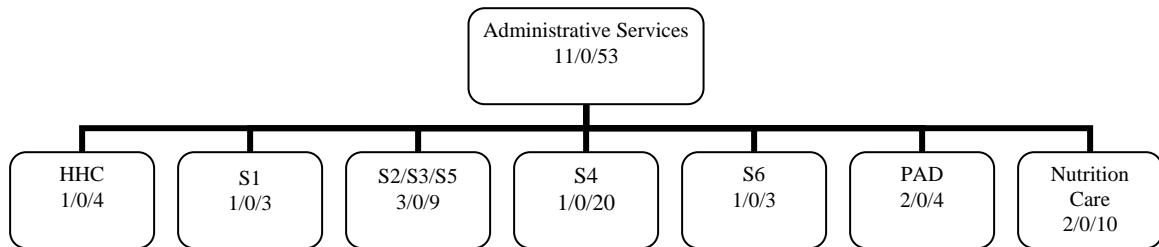


Figure 5. Proposed Medical Unit of Action Administrative Staff Structure

The clinical service staff will fall under the administrative control of the deputy commander for clinical services (DCCS). The surgical service will be built around two surgical units with two operating room tables each. A single CMS unit will support both operating units. The medical unit of action should be built around a trauma resuscitation and surgical capability. Based on OIF experience, three general surgeons, one thoracic surgeon, three orthopedic surgeons, and an oral and maxillofacial surgeon are recommended. Two anesthesiologists and four nurse anesthetists will be required for sustained operations, as well as six OR nurses and eight surgical technicians. The CMS should be staffed by a minimum of six personnel. The surgical capability of the proposed medical unit of action is austere, but if appropriately managed should sustain continuous operations. The hospital lacks extensive diagnostic capabilities, but combat surgery does not require an extensive diagnostic capability. The diagnosis of combat casualties is usually either obvious or made at the time of surgical exploration. The intended modular

structure of the MUA should allow for expansion to include additional diagnostic capabilities like a CT scanner if required. The clinical services portion of the hospital also includes the emergency medical treatment section. This part of the hospital will include four physicians including three emergency medicine doctors, and an internal medicine physician. It should also include at least six specialty-trained nurses and eight enlisted personnel. The clinical support service personnel are shown in figure 6 below.

The deputy commander of nursing services (DCN) has administrative responsibility for the nursing services. The nursing service envisioned for the MUA includes three ten-bed intensive care units (ICU) and a single 20-bed intermediate care ward. Each ten-bed ICU will be staffed with a total of 12 personnel including four clinical ICU nurses, four practical nurses, and four patient care specialists including a ward master for each ICU.

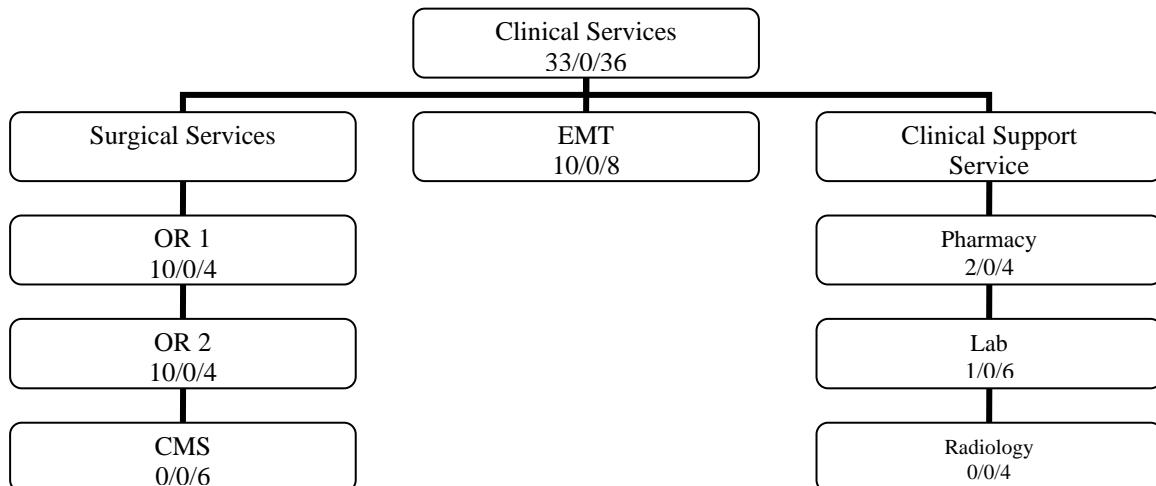


Figure 6. Proposed Organization for the Clinical Services Section of the MUA

The intermediate care ward (ICW) will be similar to the current combat support hospital ICW and will include ten personnel and twenty beds. Of these personnel, two will be clinical nurses, two will be medical specialists and six will be practical nurses. The ward master will be the senior non-commissioned officer practical nurse assigned to the ward. A head nurse will supervise each nursing ward. Figure 7 represents a possible organizational structure for the nursing section of the medical unit of action.

This organization easily supports the addition of nursing modules if the mission requires. Each module arrives with an established chain of command that plugs into the nursing service under the administrative control of the deputy commander for nursing services.

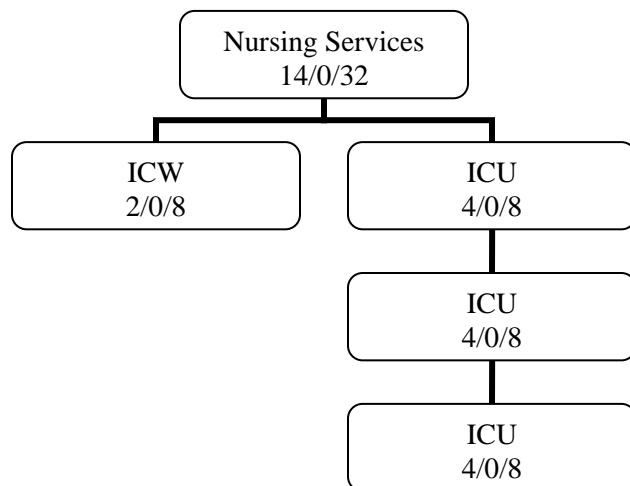


Figure 7. Proposed Nursing Services Organization for the Medical Unit of Action

The hospital ministry will remain an important aspect of level III combat health support and should include a chaplain and a chaplain assistant. The chaplain will have the responsibility at a minimum of ministering to the hospital personnel, wounded, and sick. The chaplain also serves as an advisor to the hospital commander on spiritual matters.

The medical unit of action as presented in this thesis has 188 total personnel with 64 officers and 124 enlisted and noncommissioned officer personnel. The hospital has incorporated a service and supply section that should allow for enough redundant support capability to allow the hospital to be augmented with up to three medical augmentation units. Some capabilities not mentioned here such as laundry and bath and a casting technician may be desirable, but the basic intent of providing a core hospital designed around trauma resuscitation and surgery is realized.

This hospital is very similar to the 44-bed early entry hospital element (EEHE) found in the current MRI CSH .The EEHE has 132 total personnel, and is 100 percent mobile. The 44-bed EEHE most likely does not include all of the administrative staff and deploys only one OR section with two OR beds. This is an inadequate OR capability for a hospital that is intended to support combat operations. The 50-bed medical unit of action with two operating room sections and an intact administrative staff can be constructed out of the current CSH structure, but will require a few additional 5-ton trucks to be 100 percent mobile. It is not intended to provide split based operations, but could easily be designed for echeloned movement like its predecessor, the MASH. Figure 8 is the complete recommended organizational structure for the MUA.

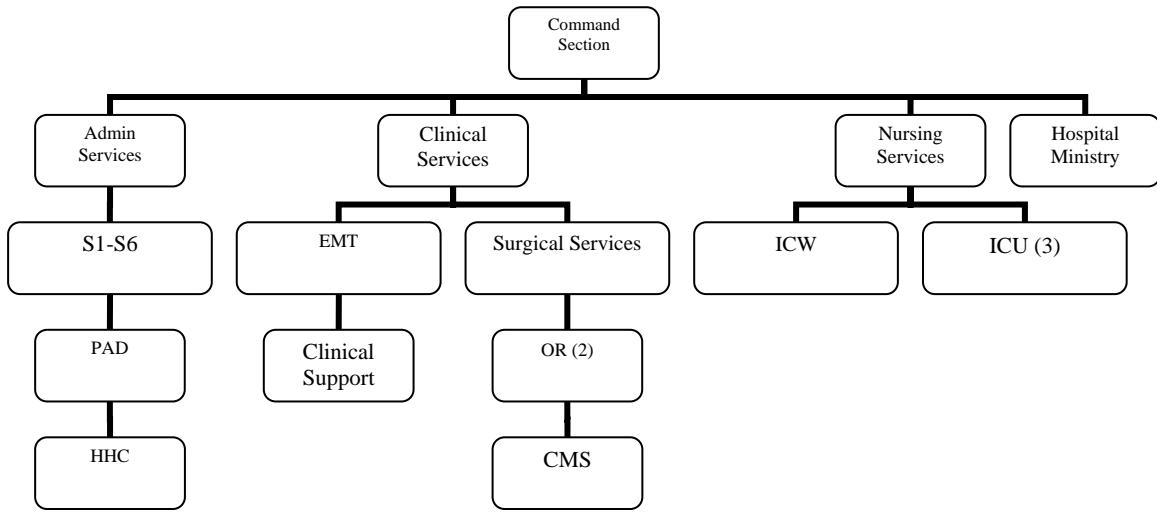


Figure 8. Complete Recommended Organizational Structure of the Medical Unit of Action.

Medical Detachments

Recent operations involving level III hospitals have been conducted using a very short evacuation period, usually less than seven days. This evacuation policy has reduced the number of beds required in theater. It is certainly possible future operations may require a longer theater evacuation policy, or that combat operations produce more casualties than have been recently encountered. If this is the case, the AMEDD must have the ability to expand the number of beds in the theater. Currently, a minimal care nursing detachment is available to augment combat support hospitals. This concept should be expanded to include intermediate and intensive care nursing detachments.

The creation of the 50-bed medical unit of action will allow the immediate creation of at least seven intermediate care wards and one intensive care unit from each of the former combat support hospitals. Currently, most of the professional staff that

serves in combat support hospitals are professional filler system (PROFIS) personnel. This means they spend the most of their time working in TDA hospitals. Military skills training is required, and occasionally PROFIS personnel complete a training cycle at a combined training center, but frequently the PROFIS training is done individually.

Using a medical detachment model, 20-bed intermediate care ward detachments would be created at posts with medical activity (MEDDAC) hospitals. The personnel assigned to these detachments would be assigned to the MEDDAC and they would be professional fillers from the local detachment. Each detachment would have a nurse commander, and they would have their own equipment. Ideally, the detachment would have a full time administrative officer and an NCO. The MEDDAC commander would be responsible for assuring the unit completed an appropriate amount of annual field training. This system would provide many benefits. The personnel would have the cohesion that develops from working together daily. The unit would be independently capable of deploying their field equipment. Medical detachments would give company grade army medical department officers an opportunity to develop leadership skills, and work on tactical field problems. It would also assure medical personnel understand how to live in a field environment. The relationship with the MEDDAC would allow the detachment commander to maintain medical equipment in good order using the MEDDAC medical maintenance system. Ideally, these units would augment a MUA at a combined training center at least every three years as a modular enhancement.

Equipment should be immediately available from the unused portion of the converted combat support hospital. Ideally, these units would be mobile, but in the case insufficient vehicles were available, the unit could train with a nearby medical company.

Dental detachments, burn unit detachments, internal medicine detachments, and psychiatric detachments could also be created. This type of detachment system could be used to build a MUA to a very large hospital with the former capability found at level IV. Each arriving detachment would be an experienced team, trained in their specialty with a previously established command structure. Using this system, the medical unit of action can also be modularly adapted to military operations other than war such as humanitarian missions that might have a larger nursing requirement, and smaller surgical requirements. Any of the resources not required by the tasked medical unit of action are immediately available for other operations.

Medical detachments would be ideally suited for reserve component units. It would allow the reserve component medical commanders to train smaller medical detachments to a high level of mission readiness. The medical unit of action would also be more easily regionally staffed in the reserve simply because it is a smaller hospital. It is more simply managed because it has fewer personnel and less equipment, and much of the required equipment for various missions would reside in the medical detachments. Of course, the medical modules would be completely interchangeable between reserve and active component medical units.

The AMEDD could field several medical units of action and theoretically build them to as much as 500 beds using active and reserve resources. If needed, using the medical unit of action, detachments and even selective service personnel, the AMEDD could build hospitals equivalent to the MASH, field, evacuation, and general hospitals previously found in the AMEDD inventory. Medical detachments also give the AMEDD the ability to centrally control deployments. Over time, the AMEDD could likely build

the number of medical unit of action hospitals to a number equal to the number of UEx and UEy organizations. If modular medical detachments are created in sufficient numbers, one MUA per UEx and UEy organization should suffice. However, to support a large modular hospital the AMEDD will need the capability to support the required infrastructure, and this will require an augmentation capability.

In order to support a modular hospital the AMEDD will need to maintain at the depot level a level IV augmentation detachment. Ideally, the AMEDD would maintain enough level IV augmentation detachments at the depot level to create a level IV capability for each UEy organization. These detachments could bring the generators, power cables, water, laundry, and dining facilities capabilities required to support whatever type of large hospital a given mission might require. It would also create a redundancy of equipment that is useful for prolonged campaigns and wars that result in the requirement for replacement and maintenance of worn out and broken equipment.

Conclusion

Level III hospitalization is a critical capability that is required for all combat operations and almost all stability operations. The critical capabilities provided include emergency trauma care, trauma surgery, and intensive care for the severely wounded. Level III is the place where badly injured and critically ill patients are collected and stabilized prior to evacuation from the theater to higher levels of care. Lower levels of care are not capable of caring for critically ill patients except for short periods of time.

The Army Medical Department frequently is required to support operations that provide mobile armored forces operating across large distances. While level III care does not need to be at the forward edge of the battle area, it does need to be close enough to

facilitate evacuation from level I and II facilities. In major combat operations it is unrealistic to rely entirely on air evacuation as was seen in OIF I during combat when sand storms precluded air evacuation. Certainly, it is desirable to have the basic level III hospital within ground ambulance range in many cases. In the future, it is likely the level III hospital will move with a tactical UEEx command post. This may often require a hospital that is capable of moving itself.

It is also likely that in nonlinear operations, level III capabilities will be required in remote areas supporting division size or smaller elements engaged in major combat operations or stability operations. The current strategy for doing this in Iraq has been split-base operations. This practice of dividing a hospital and placing it in two locations has severe limitations in command and control, logistics, transportation, staffing, and infrastructure and makes the hospital virtually non tactical once established.

The level III medical unit of action proposed in this thesis could provide the AMEDD with a truly modular hospital possessing the capability to support first and most importantly offensive and defensive combat operations with the mobility and the footprint of the MASH. It also has a base capability of an appropriate size to support small-scale contingency operations, and humanitarian operations. Its small size precludes split-based operations, but the small size also allows the AMEDD to build more of these small hospitals. Command and control elements of the hospital train as a unit and deploy and function as an intact unit similar to their counter parts in the staff sections of battalions and brigades. These smaller hospitals are easier to employ and are well suited for reserve component medical units. Capabilities can easily be enhanced through modularity.

Modularity is achieved by re-organizing the PROFIS system using medical detachments for all required medical and surgical specialties and nursing capabilities. These medical detachments would be potentially easier to train, and offer centralized AMEDD control of unit deployments. They also give the AMEDD the opportunity to train company grade officer as leaders of units important to tactical, operational, and strategic success. Importantly, they allow the medical unit of action commanders the flexibility they require to plan for specific and varied missions.

The lessons of recent operations have demonstrated the importance of level III hospitals in major combat and stability operations. It has also demonstrated the limitations of the PROFIS system and the importance of reserve medical forces. This thesis suggests a course of action that is simply an expansion of a medical detachment system developed by the AMEDD that has been very successful. This system would contribute significantly to the current national defense strategy of the United States of America that requires units that are capabilities based and efficiently deployed with the flexibility to meet full spectrum operations from smaller-scale to major combat operations simultaneously.¹³ The AMEDD should adopt this concept across the spectrum of medical capabilities. The operational module these detachments plug into is the medical unit of action that at its core provides the mobile surgical capability demonstrated to be of significant value from World War Two to Operation Iraqi Freedom.

¹³The Borden Institute, *Emergency War Surgery* (Washington, DC: Borden Institute Walter Reed Army Medical Center, 2004), 2.1-2.10.

²Melissa House, “Changing Enemy Contributes to Transformation,” (Army News Service) [article online]; available from www.tradoc.army.mil/pao/TNS/archives/September/093304.htm; Internet; accessed 15 March 2005.

³212th Mobile Army Surgical Hospital, *212th Mobile Army Surgical Hospital, Operation Iraqi Freedom (21 March-17 April 2003) Lessons Learned* (Army Medical Department Lessons Learned, 2004) [report online]; available from <https://secure-il.amedd.army.mil/Reports/OIF>; Internet; accessed 12 November 2004.

⁴Headquarters, Department of the Army, FM 8-10-13, *Employment of the Mobile Army Surgical Hospital, Tactics, Techniques, and Procedures* (Fort Sam Houston, TX, Academy of Health Sciences, United States Army, 1991), 2-36-2-63.

⁵Headquarters, Department of the Army, FM 8-10-14, *Employment of the Combat Support Hospital Tactics, Techniques, and Procedures* (Washington, DC: Headquarters, Department of the Army, 1994), 2-1.

⁶The Borden Institute, *Emergency War Surgery* (Washington, DC: Borden Institute Walter Reed Army Medical Center, 2004), 2.1-2.2.

⁷Headquarters Department of the Army, FM 4-02.10, *Theater Hospitalization* (Washington, DC: Headquarters Department of the Army, 2005), 1-3.

⁸Headquarters, Department of the Army, FM 4-02.25 (FM 8-10-25) *Employment of Forward Surgical Teams, Tactics, Techniques, and Procedures* (Washington, DC: Headquarters, Department of the Army, 2003), 2-1-2-3.

⁹Office of the Surgeon General, “General Officer Out-Brief Report, Operation Enduring Freedom Medical AAR 25 October 2002”, 9 (Army Medical Department Lessons Learned, 2004), [report online]; available from <https://secure-il.amedd.army.mil/Reports/>; Internet; accessed 1 November 2004.

¹⁰Melissa House, “Changing Enemy Contributes to Transformation,” (Army News Service, 2004) [article online]; available from www.tradoc.army.mil/pao/TNSArchives/September/093304.htm; Internet; accessed 15 March 2005.

¹¹Ibid.

¹²Angel L. Lugo, “Medical Reengineering Initiative and AMEDD Transformation, AMEDD Officers 2004-2005 Command and General Staff College”, Briefing at Fort Leavenworth, 21 March 2005, Command and General Staff College, Fort Leavenworth.

¹³*The National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2005), 10-16.

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